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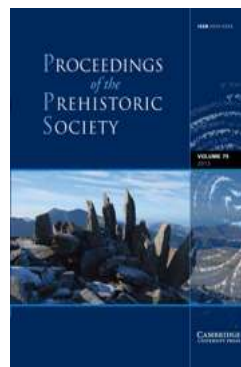
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Excavations at Upper Largie Quarry, Argyll & Bute, Scotland: New Light on the Prehistoric Ritual Landscape of the Kilmartin Glen

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incorporating contributions from

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Excavations were carried out intermittently between 1982 and 2005, by various excavators, in advance of quarrying activity at Upper Largie, Kilmartin Glen, Argyll & Bute. They revealed abundant evidence of prehistoric activity, dating from the Mesolithic to the Middle Bronze Age, on a fluvioglacial terrace overlooking the rest of the Glen, although some evidence was doubtless destroyed without record during a period of unmonitored quarrying. Several undated features were also discovered. Mesolithic activity is represented by four pits, probably representing a temporary camp; this is the first evidence for Mesolithic activity in the Glen. Activity of definite and presumed Neolithic date includes the construction, and partial burning, of a post-defined cursus. Copper Age activity is marked by an early Beaker grave which matches counterparts in the Netherlands in both design and contents, and raises the question of the origin of its occupant. The terrace was used again as a place of burial during the Early Bronze Age, between the 22nd and the 18th century, and the graves include one, adjacent to the early Beaker grave, containing a unique footed Food Vessel combining Irish and Yorkshire Food Vessel features. At some point/s during the first half of the 2nd millennium BC – the oak-based dates may suffer from ‘old wood’ effect – three monuments were constructed on the terrace: a pit, surrounded by pits or posts, similar in design to the early Beaker grave; a timber circle; and a post row. The latest datable activity consists of a grave, containing cremated bone in a Bucket Urn, the bone being dated to 1410–1210 cal BC; this may well be contemporary with an assemblage of pottery from a colluvium spread. The relationship between this activity and contemporary activities elsewhere in the Glen is discussed.

INTRODUCTION AND LOCATION

Upper Largie (NGR: 8330 9955) is a fluvioglacial terrace located at the northern end of the Kilmartin Glen in Argyll & Bute in the west of Scotland (Fig. 1). The Glen is well known for the wealth of its

archaeological remains, having one of the highest densities of prehistoric sites in Scotland (RCAHMS 1988; Butter 1999). In 1982, permission was granted to extend an existing gravel quarry at Upper Largie, and small-scale rescue excavations undertaken at the southern end of the terrace between December 1982 and August 1983 revealed the remains of an Early Bronze Age short cist cemetery, together with other Bronze Age graves (Mercer & Rideout 1987). Subsequent excavations, funded by the quarry owners M & K MacLeod, were undertaken intermittently between 1993 and 2005 as the quarry advanced. In the

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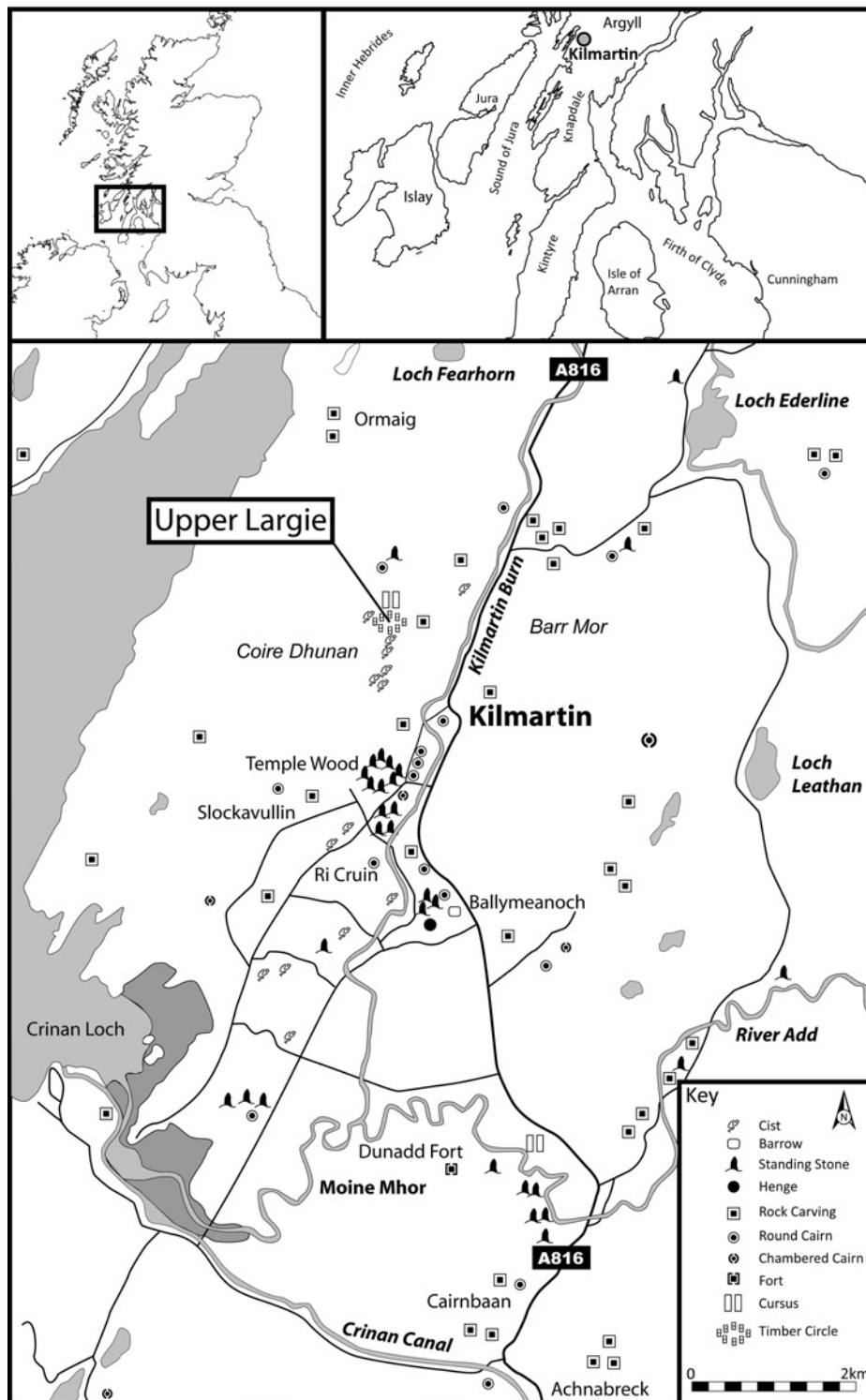


Fig. 1.
Location plan

intervening decade, the quarrying had progressed without any archaeological investigation, and this probably accounts for the 'blank' area between the features excavated in the 1980s and the 1990s, any archaeology in this area not having been recorded. Excavations by Scotia Archaeology Ltd in 1993 (directed by Alan Radley) and 1997 (directed by John Terry) revealed the existence of a complex of prehistoric monuments at the northern end of the terrace (Radley 1993; Terry 1997). In 1999 AOC Archaeology Group evaluated areas to the west and east of the main monuments and in 2000 completed the excavation of the stripped area (directed by Clare Ellis). A final phase of evaluation and excavation to the north of the excavated complex was completed in 2005 (directed by Martin Cook), and AOC were subsequently commissioned to undertake a post-excavation programme and to report on all the fieldwork. Overall, this fieldwork has revealed a palimpsest of activities, mostly funerary and ceremonial in nature, ranging from the Mesolithic to the Middle Bronze Age and including an Early Neolithic cursus monument, probable timber graves containing Beakers and a Food Vessel, several cists, and an Early Bronze Age timber circle.

This paper draws together the field results from the excavations of 1993, 1997, 2000, and 2005 and the combined post-excavation programme, and integrates these with the results of the 1982/3 fieldwork. It also incorporates the results of other work that was undertaken independently of AOC's project, namely a programme of radiocarbon dating of cremated bone from the 1982/3 excavations and from other sites in the Kilmartin Glen, undertaken by National Museums Scotland with sponsorship by Historic Scotland (Sheridan 2008a); an archaeoastronomical survey of the alignment of certain monuments on the terrace undertaken by Douglas Scott; and the lipid analysis of sherds from two of the early Beaker pots from the Copper Age grave (see below), undertaken by Lucija Šoberl of Bristol University as part of a post-doctoral research project on Copper Age and Early Bronze Age pottery use; and the isotopic analysis of tooth enamel and collagen from the occupant of Cist 3, as part of the *Beaker People Project* that investigates diet and mobility in Copper Age and Early Bronze Age individuals in Britain and Ireland (Jay & Montgomery 2008). The evidence is presented, and then discussed, in the chronological order (demonstrated or presumed) of the prehistoric activities that created it; where there is no empirical evidence for date, features have been

allocated to a chronological period either on the basis of spatial and stratigraphic relationships, or through comparative analysis. The discussion aims to set the Upper Largie discoveries within the context of activities in the Kilmartin Glen as a whole, and within the broader archaeology of Neolithic, Copper Age, and Bronze Age Scotland. Full specialist reports can be found in the site archive, housed in the National Monuments Record of Scotland, Edinburgh. Radiocarbon dates have been calibrated using OxCal 4.1, using environmental data from IntCal09 (Reimer *et al.* 2009), and are cited at their 2σ value.

The south-facing Upper Largie fluvioglacial terrace is situated just north of the village of Kilmartin, where the Glen narrows. It rises abruptly from the Glen floor, reaching a height of 15 m above the floor and lying around 40 m OD (Fig. 2). The terrace is cut by two glacial outwash channels, the western one forming a sharp break of slope and delimiting the western side of the cursus and timber circle and the eastern channel, far less prominent than its partner, forming the eastern limit of the same monument (Fig. 2). The monuments are concentrated along the centre of the terrace; indeed the cursus and the avenue appear to be aligned on the south-western tip of the terrace as does the line of cists (Fig. 2). The terrace commands extensive views down the Glen to the south, and is overlooked by the steep slopes of Bàrr Mòr to the east and Coire Dhùnan to the west.

Prior to gravel extraction the site was under pasture. The area was once within parkland and some of the trees of the park survive to the present. The topsoil was relatively shallow and in all the post-1983 seasons of excavation it was removed by machine and the exposed sub-surface hand cleaned. The central portion of the site had been topsoil-stripped three years prior to its excavation in 2000. Bioturbation caused by tree roots, perennial weeds, grasses, and worm activity was common throughout the site. Such activity was especially concentrated within natural silt accumulations and within the larger archaeological features.

MESOLITHIC FEATURES

These comprise two irregular-shaped pits, [3100/3104] and [3101], and two other shallow, sub-oval pits, [3091] and [3077], all located in a cluster within approximately 17 m of each other (Fig. 3). This cluster also includes two substantial post-holes [3071]

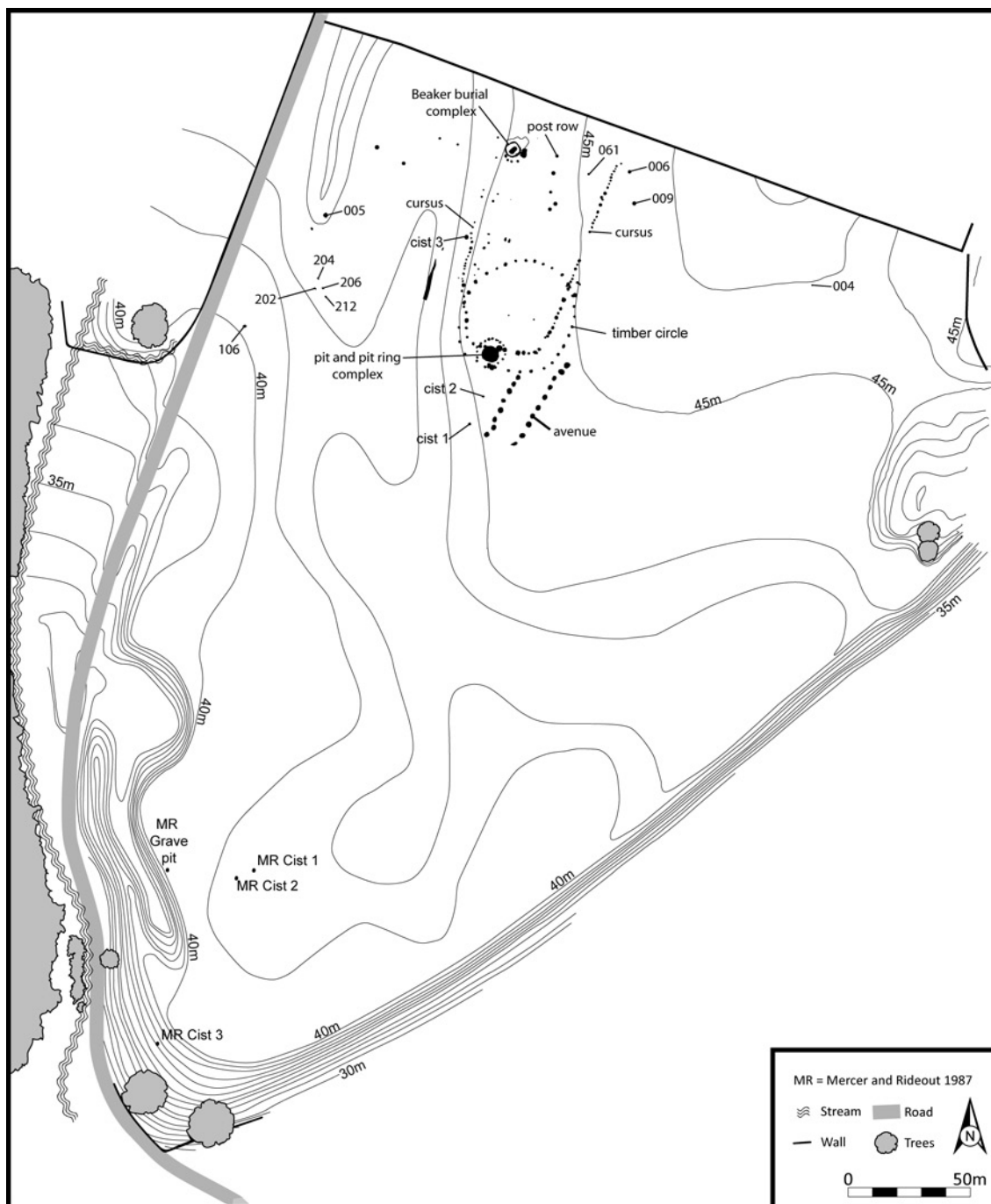


Fig. 2.
The site in its topographic setting

and [3078]. The former had a ring of horizontally laid stone packing, surrounding a well defined postpipe and containing two fragments of hazel. Their shape and size distinguishes them from the other Mesolithic features in the cluster but they cannot be clearly related to any of the later features on the site.

Of the irregular-shaped pits, the western one encompassed two sub-circular pits, [3100] and [3104]. Pit [3100] was 0.81 m wide at its widest and 0.11 m deep; [3104] was 0.60 m wide and 0.14 m deep. Adjacent Pit [3101] was sub-oval in plan, with near-vertical sides; its rounded base was slightly stepped on the northern side. It measured 1.40 m wide and 0.31 m deep and its lower fill was rich in charcoal. Pit [3091] comprised a figure-of-eight cut and was very similar to [3100/3104] but smaller. Three samples of oak charcoal recovered from Pit [3101] were radiocarbon dated, producing statistically indistinguishable calibrated dates within the third quarter of the 5th millennium cal BC (GU-9374, GU-9375 and GU-9376; Table 1). It was not possible to tell, from the charcoal, whether it came from the heart or the outer part of the tree. This means that it is unclear whether the activity actually dated to the later 5th millennium, or to a time up to several centuries later, if heartwood had been dated.

FEATURES OF DEFINITE AND PROBABLE NEOLITHIC DATE

These comprise a post-defined cursus that probably dates to the first half of the 4th millennium; a parallel pit alignment, or 'Avenue', whose dating is problematic; and miscellaneous features and artefactual finds of probable Neolithic date.

The post-defined cursus

The feature described as a post-defined cursus consisted of an elongated U-shaped setting defined by a minimum of 77 post-holes (Fig. 3); a further four had been recorded during the 1993 and 1997 field seasons but it is unclear from the available archive material whether these were believed to be 'real' archaeological features or natural variations within the subsoil. Following the 1993 season the quarry face was worked right up to the edge of the excavated area, a process repeated following the 2000

excavation. This unfortunately resulted in the loss of a number of features through quarry-face collapse and when the excavations resumed, other features could not be investigated because of their proximity to the quarry edge. The 2005 excavation confirmed the total known length of the excavated lines of post-holes as approximately 88 m. To judge from features visible in a 1988 RCAHMS aerial photograph (Fig. 4), it is likely that the cursus had extended some considerable distance further, to the north-east, kinking and terminating in a squared-off end just south of Upper Largie Farm. A possible ring of pits or post-holes can just be made out inside this terminal.

The post-holes varied considerably in size and profile, even allowing for the fact that they are truncated remnants (Fig. 5). They were set between 1.03 m and 3.79 m apart, centre to centre, with an average spacing of 2.24 m; alternatively, if one does not correct for missing or unclear data, the spacing is up to 5.65 m apart, with an average of 2.42 m. (This figure is based on the average distance between the post-holes excavated during the 1993–2000 phase only, as the post-holes excavated in 2005 were severely truncated and likely to distort the figure). No repeating post-setting pattern was discernible, although there was generally less distance between the post-holes on the western side of the structure and greater distance between them at the southern end. The shallower post-holes ([027], [029], [031], and [017]) generally occurred on the western side, following the line of a sharp break in slope, the point at which truncation would have been most severe. It therefore seems likely that at least some of the post-holes have been lost in the intervening years. The deepest post-hole was 0.88 m while the shallowest was 0.04 m.

The post-hole fills comprised various matrix-supported gravels and grits. The natural sediment of the base of [3053] was scorched, suggesting *in situ* burning. The impression of decayed posts or post-pipes was recorded in 18 post-holes, that is 23% of those with a depth equalling or exceeding 0.36 m (Fig. 5), and there was also one very dubious impression in a shallower post-hole [1104]. The post-pipes were concentrated in the southern and south-western post-holes. Two post-holes, [305] and [303], had near-horizontal fills rich in charcoal. A few may have been burnt *in situ*; [3125] displayed the concentration of charcoal near the base of the post-pipe characteristic of posts that have burnt *in situ* (Barber 1997, 137).

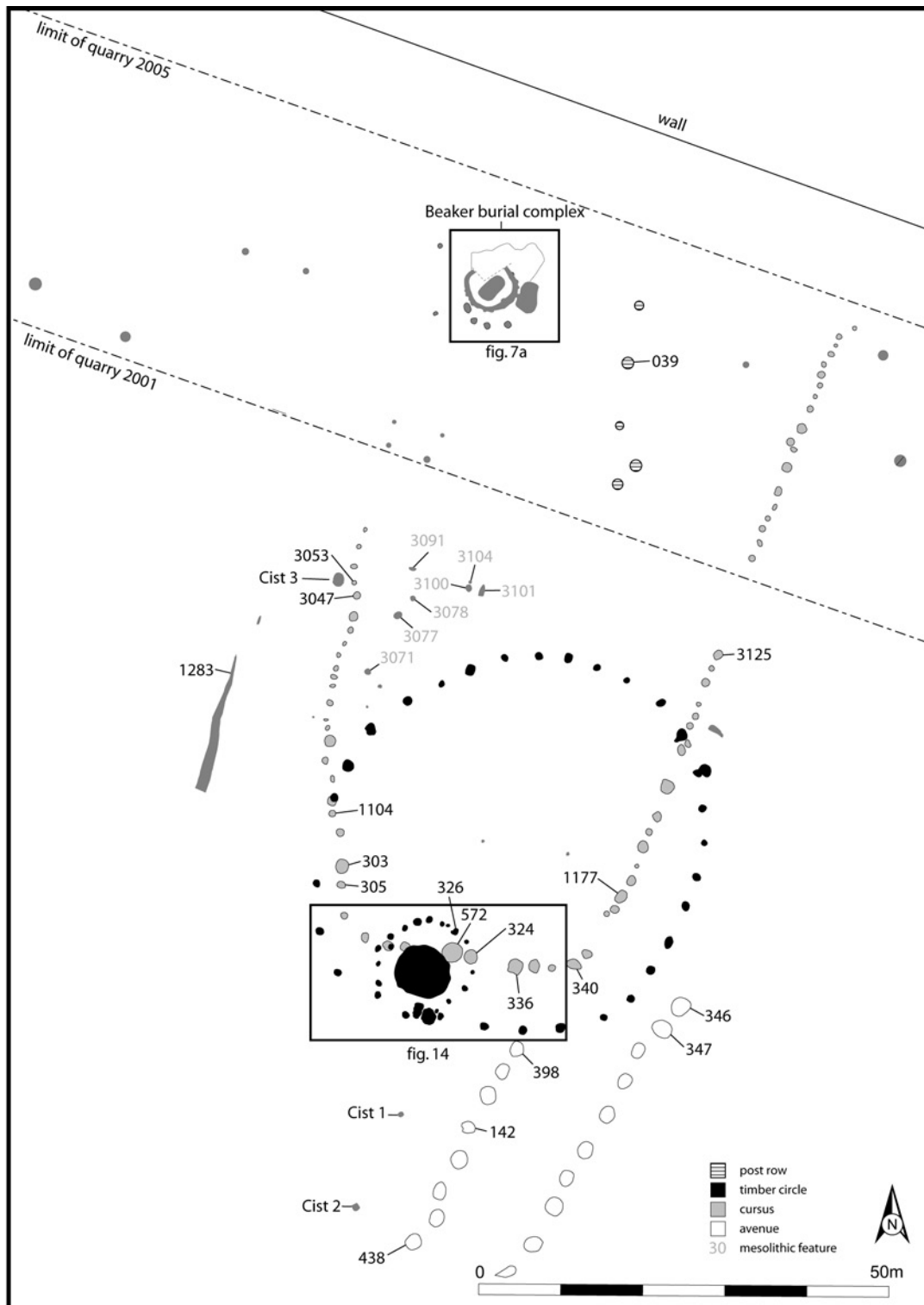


Fig. 3.
Detailed plan of the site (all features mentioned in the text labelled)

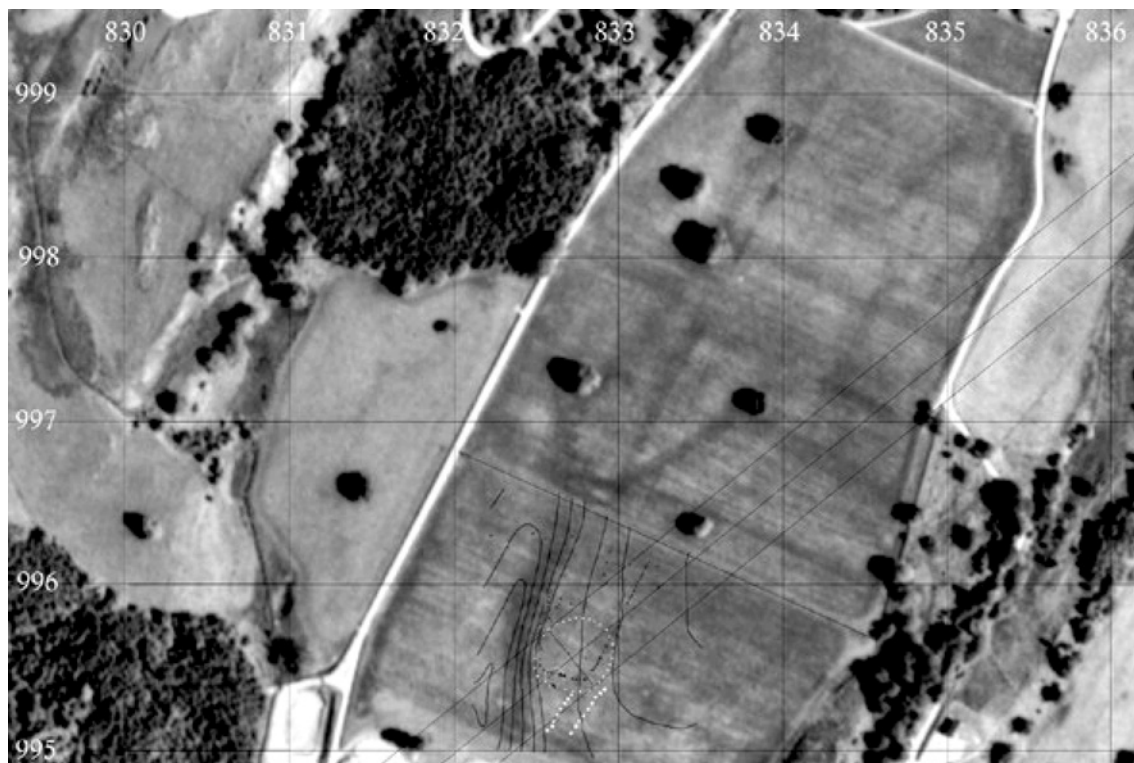


Fig. 4.

Aerial photograph (SC 1073727: 1988) with excavated features superimposed. The cursus is visible as a cropmark extending to the north-east and terminating in a squared-off end © RCAHMS (All Scotland Survey Collection)

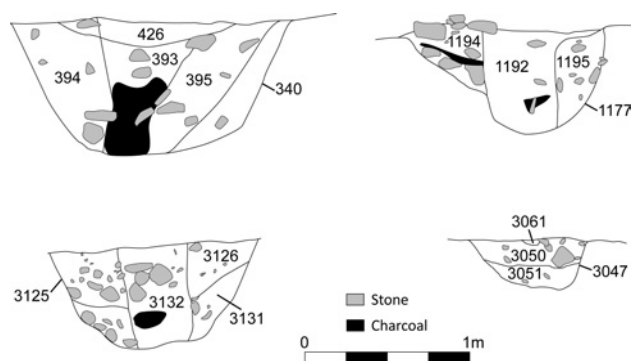


Fig. 5.

Representative sample of post-hole sections from the cursus

Others may have rotted *in situ* and others still may have been removed. The organic content of many of the post-holes confirms the use and presence of decayed or burnt posts. It is clear that all the post-holes once held substantial posts.

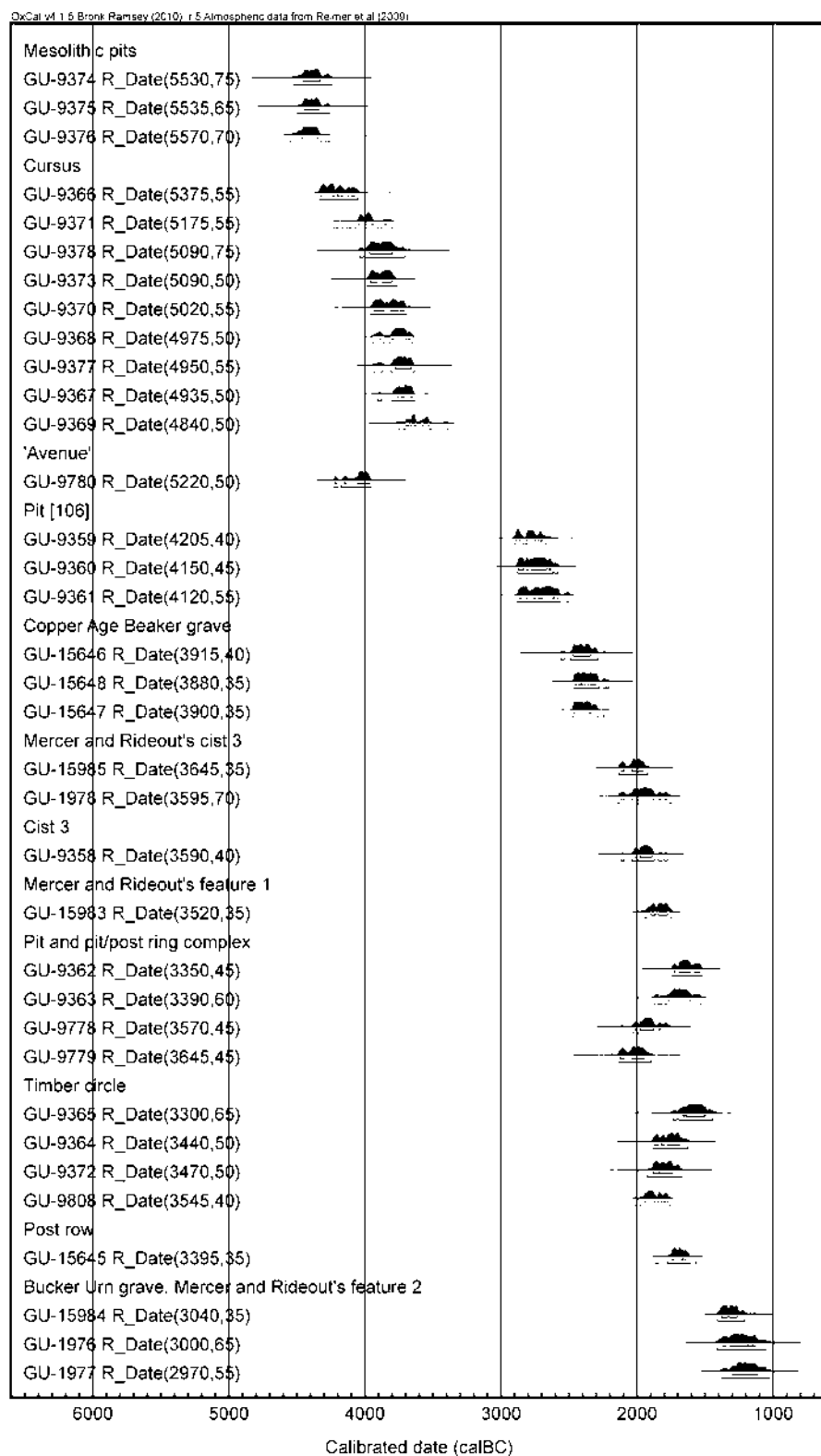
Post-hole [303] (Fig. 3) yielded a double end-scraper/knife/fabricator with marginal retouch (Fig. 13; SF 10) This is made on a large regular blade of greyish-brown flint; its sides each have continuous semi-abrupt to abrupt retouch in knife fashion, and its convex ends are scraper-like. The tool shows signs of heavy use, with the proximal scraper end worn completely smooth and the distal end and sides having significant abrasion. A small irregular flake from the same feature is made of similar flint.

Charcoal from 13 post-holes was examined, and found to be almost exclusively of oak; ten post-holes contained only oak charcoal while the remaining three contained 99% oak, along with fragments of hazel (*Corylus avellana*). Oak charcoal fragments from nine

TABLE 1: RADIOCARBON DATES RELATING TO MATERIAL FROM UPPER LARGIE, CALIBRATED USING OXCAL 4.1 AND ROUNDED TO NEAREST DECADE, PRESENTED IN THE ORDER IN WHICH THEY ARE DISCUSSED IN THE TEXT WITH (OPPOSITE) PROBABILITY DISTRIBUTIONS

SUERC GU- no.	AMS Facility code no.	Context	$\delta^{13}C$	Radiocarbon age BP	Calibrated age cal BC, 2 sigma
<i>Mesolithic pits</i>					
GU-9374	AA-43020	3117A: fill Pit [3101]	-26	5530±75	4530–4240
GU-9375	AA-43021	3117B: fill Pit [3101]	-26	5535±65	4500–4260
GU-9376	AA-43022	3117C: fill Pit [3101]	-25	5570±70	4550–4270
<i>Cursus</i>					
GU-9366	AA-43013	368A: fill p-h [303]	-25	5375±55	4340–4050
GU-9371	AA-43411	3058: fill p-h [3049]	-25.9	5175±55	4340–3800
GU-9378	AA-43024	3134: fill p-h [3133]	-25.1	5090±75	4230–3710
GU-9373	AA-43019	3108: fill p-h [3093]	-24.8	5090±50	3990–3770
GU-9370	AA-43017	3046: fill p-h [3039]	-26.5	5020±55	3960–3700
GU-9368	AA-43015	2074: fill p-h [2071]	-24.1	4975±50	3940–3650
GU-9377	AA-43023	3131: fill p-h [3125]	-26.2	4950±55	3940–3640
GU-9367	AA-43014	2073: fill p-h [1104]	-25.1	4935±50	3910–3640
GU-9369	AA-43016	3045: fill p-h [3038]	-26.3	4840±50	3750–3390
<i>'Avenue'</i>					
GU-9780	AA-48052	508: fill Pit [142] – pit alignment	-25.9	5220±50	4230–3960
<i>Pit [106]</i>					
GU-9359	AA-43007	109A: fill Pit [106]	-24.6	4205±40	2900–2670
GU-9360	AA-43008	109B: fill Pit [106]	-25.1	4150±45	2880–2580
GU-9361	AA-43009	109C: fill Pit [106]	-26.1	4120±55	2880–2500
<i>Copper Age Beaker grave</i>					
GU-15646	SUERC-15646	125: fill large pit [053]	-26.4	3915±40	2560–2290
GU-15648	SUERC-15121	138: fill ring ditch [137]	-26.0	3880±35	2470–2210
GU-15647	SUERC-15120	134: fill post-pipe within [138]	-27.0	3900±35	2480–2240
<i>Mercer & Rideout's cist 3</i>					
GU-15985	SUERC-16633	Cremated human bone	-26.8	3645±35	2140–1920
GU-1978	-	Charcoal (alder, oak, willow, small diam. roundwood)	-26.1	3595±70	2140–1750
<i>Cist 3</i>					
GU-9358	AA-43006	Cist 3: human femur	-21.5	3590±40	2120–1780
<i>Mercer & Rideout's feature 1</i>					
GU-15983	SUERC-16631	Cremated human bone	-27.6	3520±35	1940–1750
<i>Pit and pit/post ring complex</i>					
GU-9362	AA-43010	322A: oak, Pit [322]	-25	3350±45	1740–1530
GU-9363	-	322B: alder Pit [322]	-28.5	3390±60	1880–1530
GU-9778	AA-48050	417: fill p-h [326]	-26	3570±45	2030–1770
GU-9779	AA-48051	410: fill p-h [329]	-26.9	3645±45	2140–1900
<i>Timber circle</i>					
GU-9365	AA-43012	343: post in p-h [343]	-25.6	3300±65	1740–1440
GU-9364	AA-43011	342: post in p-h [342]	-25	3440±50	1890–1630
GU-9372	AA-43018	3064: post in p-h [3032]	-25.6	3470±50	1920–1670
GU-9808	AA-48026	1257: fill of p-h [1120]	-26.3	3545±40	2010–1760
<i>Post row</i>					
GU-15645	SUERC-15118	064: post of p-h [039]	-24.1	3395±35	1870–1560
<i>Bucket Urn grave, Mercer & Rideout's feature 2</i>					
GU-15984	SUERC-16632	Cremated human bone	-22.7	3040±35	1410–1210
GU-1976	-	Alder & willow charcoal	-26.6	3000±65	1410–1050
GU-1977	-	Alder, hazel, & oak charcoal	-26.4	2970±55	1380–1020

Dates calibrated using OxCal 4.1 & rounded to nearest decade, presented in the order in which they are discussed in text



individual post-holes were radiocarbon dated, producing dates ranging between 4340–3800 cal BC and 3750–3390 cal BC but mostly clustering between 3950–3650 cal BC (GU-9366–9371, GU-9373, GU-9377–8; Table 1).

Parallel pit alignment – the ‘Avenue’

Eighteen pits were recorded in plan during the 1993 excavation (Radley 1993). Two parallel linear arrangements of pits, eight on the western side and ten on the eastern, were oriented approximately north-north-east to south-south-west (Fig. 3). The eastern line measured 28.59 m and the western 40.10 m; neither line was true. The two lines of pits lay between 11.09 and 13.76 m apart (centre to centre). The spacing between the pits was between 3.50 m and 5.30 m on the western side and between 3.20 m and 4.60 m on the eastern side.

The pits on the eastern side varied in width between 1.50 m and 2.30 m, while those on the western side were between 0.90 m to 2.10 m wide. Pits [346] and [347] were larger in plan and were slightly off-set. The pits were between 0.84 m and 1.21 m deep and were all similar in profile. From the flat or slightly concave pit floors the sides rose steeply to approximately half of the pit depth (Fig. 6). Above this the slope decreased and in a few cases this was quite marked and produced skewed, inverted bell-shaped profiles. The fills of 14 of the pits were layered roughly horizontally. However, four pits showed possible collapsed post-pipe packing, in the form of concentrations of stones. The stratigraphy of the pits was fairly consistent, tending to comprise an upper saucer-shaped deposit of silt or sand loam and lower deposits of loose, matrix supported, fine to medium gravels.

No artefacts were recovered and only a limited number of sediment samples from this structure were within the archive received by AOC Archaeology Group. Only one pit, [142], produced a single identifiable fragment of oak charcoal. A radiocarbon date was obtained from this charcoal, 5220±50 BP (GU-9780, 4230–3960 cal BC), which would *prima facie* suggest that the ‘Avenue’ is comparable in date to the cursus (Table 1). However, this date must be treated with extreme caution; although only a few samples from this structure were available for processing no charcoal was observed in any of the pits during their excavation, so the taphonomy of the single fragment of charcoal is dubious. Given the

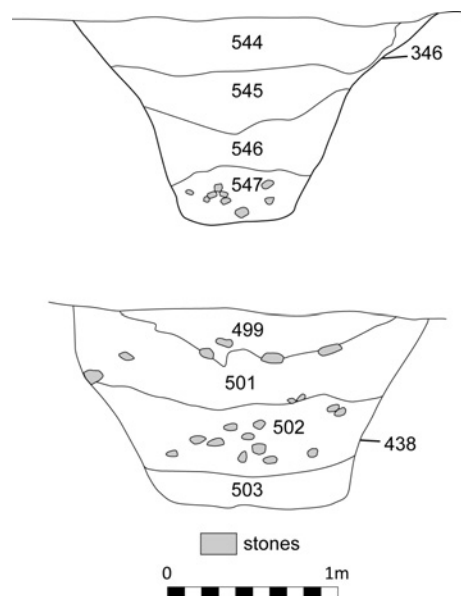


Fig. 6.
Representative sections through pits of the ‘Avenue’

quantities of oak charcoal generated around the cursus there is a very high probability that the charcoal from the ‘Avenue’ is residual, and so a Neolithic date for the ‘Avenue’ remains unproven.

Other activity of definite or presumed Neolithic date

Evidence for other Neolithic activity on the terrace is sparse, and its nature and significance are unclear. On the terrace’s western side is a cluster of probable truncated post-holes that may have formed a structure (features [202], [204], [206], and [212]: Fig. 2). One of these, [202], produced a flint blade made of the same kind of flint as the scraper/knife/fabricator and flake found in Pit [303] of the cursus, so the activity represented here could conceivably be contemporary with the cursus. However, a later date cannot be ruled out.

To the west of these features is an isolated pit, Pit [106], which may have been a cooking pit (Fig. 2). This contained burnt stones and charcoal of oak, hazel, alder, and *Pomoideae*, but no artefacts. Three samples of charcoal from the short-lived species produced radiocarbon dates (GU-9359–61; Table 1) calibrating to between *c.* 2900 and *c.* 2500 BC,

indicating a Late Neolithic date for the activity here.

A further isolated pit [004], on the eastern side of the terrace, produced two fine end scrapers made from flint, most probably from Yorkshire (Fig. 13; SF 1a and 1b). One of these (SF 1a) is a horseshoe-shaped scraper, made on a large, tertiary flake of fresh dark grey flint, with short, abrupt scaled retouch; the distal end is abraded through wear. The other (SF 1b) has been truncated by a blow from the left, snapping the base. These scrapers could well be of Late Neolithic date (and thus possibly contemporary with Pit [106]), since it is known that Yorkshire flint was being imported to parts of southern Scotland in significant amounts at this time (Torben Bjarke Ballin, pers. comm.).

Other artefactual finds of potential Neolithic date comprise unassociated finds recovered from the topsoil, mostly of unretouched flint flakes but also including a blade fragment of imported dark green aphyritic pitchstone from Arran (Fig. 13; SF 4). There are also a few pieces of possibly worked quartz, including a retouched chunk that is probably a fragmentary core (not illustrated).

COPPER AGE ACTIVITY: A GRAVE CONTAINING EARLY BEAKERS

A complex of features consisting of a sub-rectangular pit [053], surrounded by a ring ditch [137], together with an arc of four post-holes, was identified during the 2005 excavation (Fig. 7). This lay just inside the western arm of the cursus (Fig. 3). The pit was partially excavated through a pre-existing tree-throw hole [054].

The sub-rectangular pit [053] was aligned north-east to south-west. It measured 3.20 m by 1.75 m, and was up to 0.63 m in depth. The sides of the cut were relatively straight, as was the base (Fig. 7). The upper fill comprised a mid-grey firm sandy clay [101] with occasional inclusions of stones. Below was a 0.50 m deep layer of flattish angular local schist stones [102], measuring between 0.20 m and 0.70 m in size (Fig. 8). The stones, which appeared to slope towards the base of the cut, were more prominent towards the middle of the feature, suggesting that they may have collapsed into a hollow centre (Figs 7 & 8). A second layer of stones, 0.20 m deep comprising small rounded cobbles [124], lay underneath these (not seen in

section – Fig. 7). The primary fill comprised a dark brown damp organic silty deposit, [125], which contained three Beakers and two flint artefacts (see below). The pit contained no direct evidence for a cist or wooden structure and no skeletal remains were recovered. However, the collapse of the flat stones [102], together with the way in which the pots had broken (see below), suggests that there may originally have been an organic structure, such as a wooden ‘cist’, within the pit, covered by a low cairn. When the wood decayed, the structure collapsed under the weight of the stones and this collapse caused the damage to the pots. This, and the presence and disposition of the artefacts, makes it very likely, therefore, that the pit was indeed a grave.

The sub-oval ring ditch [137] that surrounded the pit measured 5.80 m north-east to south-west by 5.70 m north-west to south-east and varied in width between 0.45 m and 0.80 m; it was up to 0.40 m deep. Its north-west section was only partially identified in section, the rest having been truncated. Its fill consisted of a light grey, compact silty clay [138] which was extremely hard to distinguish from the surrounding material, suggesting that the ditch may have been filled in soon after excavation. A series of 15 post-holes were identified within the ditch fill and generally comprised post-pipes, 0.20–0.50 m in width and up to 0.40 m in depth. The post-pipes were spaced 0.10–0.90 m apart, and in all but two cases were located on the outer edge of the ditch. Despite the apparent truncation to the north-west of the ring ditch it is assumed that the post-pipes would have existed all the way around the feature forming a post-ring. The sub-rectangular pit [053] was off-set in relation to the ring ditch (Fig. 7).

An arc of four larger post-holes, [046], [019], [105], and [107], was located to the immediate south of the pit and ring ditch. The post-holes measured 0.46–0.90 m in diameter and were 0.10–0.15 m in depth. The identification of post-pipes in one of the features [105] suggests that all four may have supported posts. Apart from the post-pipe in [105] the post-holes contained only a single fill, generally comprising a sandy gravel fill. Although the post-holes appeared to respect the ring ditch it is unclear whether they were actually associated with it, or were added subsequently.

A combination of birch (*Betula* sp.), hazel (*Corylus avellana*), and oak (*Quercus* sp.) charcoal was recovered from the sub-rectangular pit [053].

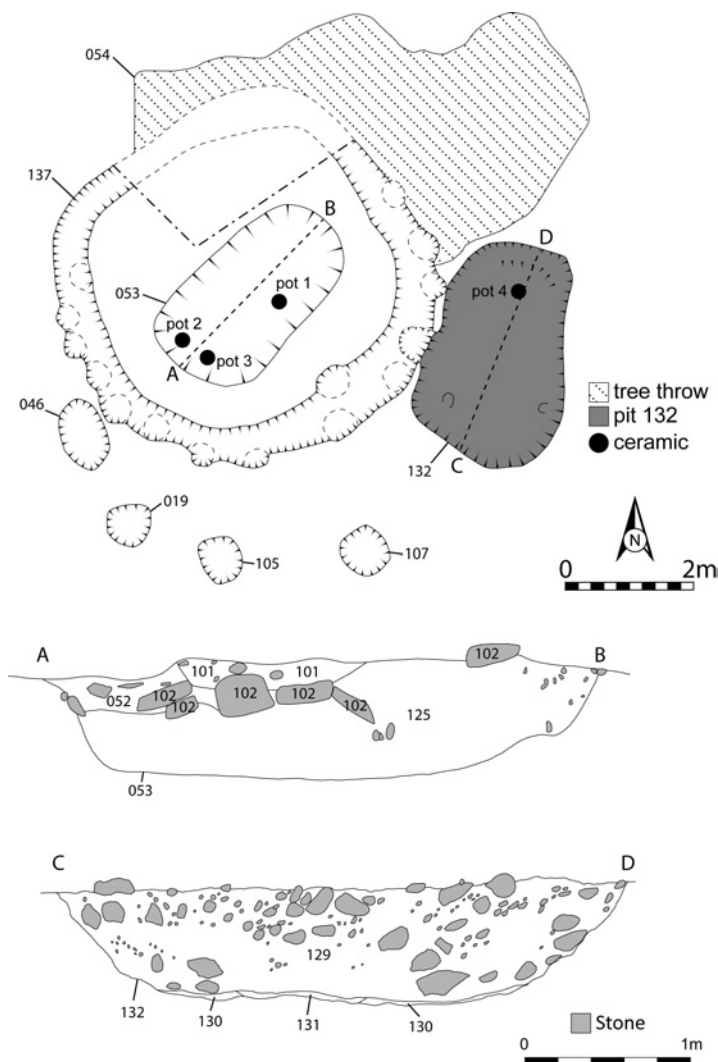


Fig. 7.

Upper: the Beaker burial complex; middle: section through Pit [053]; lower: section through Pit [132]

The hazel fragment was radiocarbon dated to 3915 ± 40 BP (SUERC-15119, 2560–2290 cal BC: Table 1). Over 80 fragments of oak were recovered from the ring ditch and probably represent the remains of posts. Two radiocarbon dates were obtained from the ring ditch, one from oak charcoal within the general fill, and one from a single oak post; these produced dates of 3880 ± 35 BP (SUERC-15121, 2470–2210 cal BC) and 3900 ± 35 BP (SUERC-15120, 2480–2240 cal BC) respectively (Table 1).

The Beakers from pit [053] (SF 4–6)

These three Beakers (Figs 9–12) are uniformly thin-walled, fine-textured, and very well made and, as will be discussed below, all are of international Bell Beaker styles. All three pots had been deposited upright, with Pot 1 (SF 4) being placed along the eastern side of [053], and Pots 2 and 3 (SF 5–6) at its south-west end. All had been damaged during the collapse of the structure, but to differing degrees and in different ways. Pot 1 had evidently been hit from above and



Fig. 8.
The layer of stones [102] in Pit [053]

crushed flat into over 100 pieces, its neck being pushed down into the body as the pot tilted over (Fig. 9a). Pot 2 had had its upper part knocked off, but was found with its lower part intact, standing upright (Fig. 9b). Pot 3 had been knocked onto its side and crushed flat (Fig. 9c). While it was possible to reconstruct Pot 3 into its original shape, Pot 1 had been distorted by the weight of material lying on it, so that when the conjoining pieces were refitted, the belly turned out to be oval in plan, and much of the upper body had lost its original curvature.

POT 1 (SF 4)

Around two-thirds of the pot survives (Fig. 10), its pieces ranging in size from large sherds to crumbs; the missing parts, from the upper body on one side, may have decayed away completely. Despite the aforementioned distortion, it has been possible to determine its original size and shape, and these are shown in Figure 10, which 'reconstructs' the pot graphically. It had been a large, sinuous-profiled vessel with a gently splaying neck and a low, bulbous belly, the latter reaching its widest point at just over a third of the pot's height. The estimated height is *c.* 233 mm; the estimated diameters at the rim and belly are *c.* 200 mm and 180 mm respectively; and the base diameter is 97 mm. Wall thickness varies from 5.7 mm at the rim to 9.7 mm at the base. The rim is gently squared off and the base is minimally dished on the outside and flat on the inside; the interior wall rises from the base in a continuous curve. The minimal dishing of the exterior had been caused by the potter slapping the base while the clay was still moist; this was done to prevent the vessel from sticking and cracking while drying (Hammersmith 2005). The exterior and interior surfaces are mostly reddish (varying in shade around the pot's exterior from a brick red to a light red-brown); in places on the exterior the colour shades into a buff, and at one point it is dark grey. The core is medium to dark grey, indicating that the pot had been rapidly fired. Substantial traces of a blackish-brown and yellowish crusty organic residue – almost certainly representing the evaporated remains of the pot's original contents – are present on the inside and/or outside of several sherds, including one rimsherd, where it had extended over the top of the rim. The vessel had been built up using straps (flattened coils) of clay, added to the base and lower belly which had probably been created from a single piece of clay (Hammersmith, pers. comm.). Horizontal fracture lines follow these strap joints, and the junctions are smooth and steep-sided, showing how the edges of the straps had been smoothed up- or downwards to secure the joint.

The surfaces had been very carefully smoothed before decoration of the exterior, and have either been slipped (ie, covered with a thin clay slurry) or wet-smoothed to produce a slip-like appearance. Prior to decoration, and while the clay was still moist, the exterior had been buffed to a low sheen, possibly using an animal-skin pad. A further wipe-over had been undertaken after the pot had been decorated, slightly blurring some of the comb impressions (see below). It is possible that the interior and/or exterior had been scraped to thin the walls (*cf.* Hammersmith 2005), but if this had been the case, all traces have been obliterated. There are, however, slight finger-indentations in the interior surface at the belly's broadest point, from the shaping of the belly. There is post-depositional abrasion (ie, surface loss) to parts of the exterior.

The pot's exterior had been painstakingly and skilfully decorated by applying a short (*c.* 7.5 mm long), narrow (*c.* 1.7 mm), fairly straight, fine-toothed comb several hundred times to create 13 zones of horizontal lines, running around the pot from just below the rim to immediately above the base. All the zones (which are interspersed with plain bands) comprise three lines except the bottom zone (consisting of a

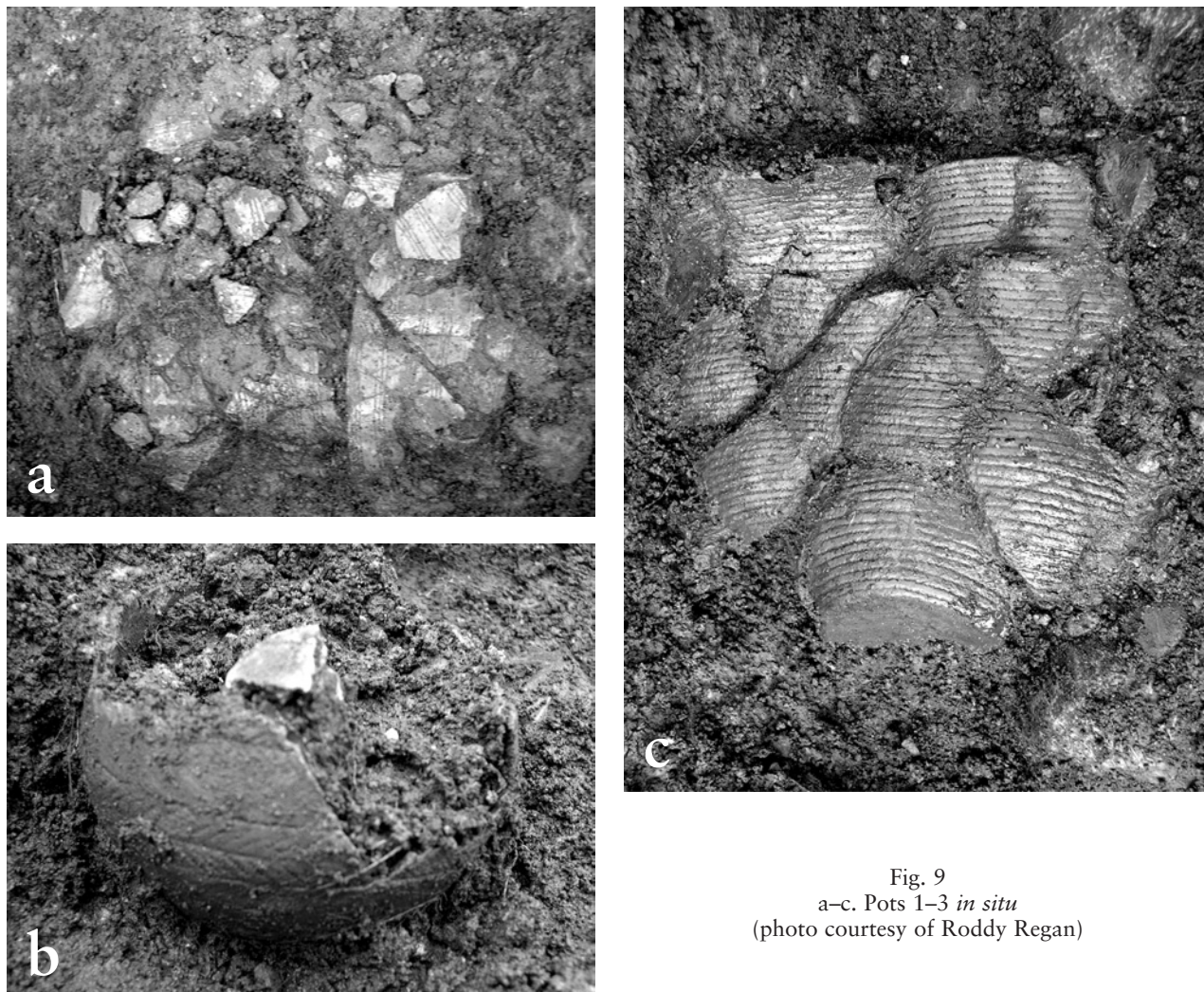


Fig. 9
a–c. Pots 1–3 *in situ*
(photo courtesy of Roddy Regan)

single line) and the next zone up, on the lower belly, where three lines expand into four over part of the circumference. The zones on the lower belly are slightly further apart from each other than the zones higher up. Between the two uppermost zones is a pair of single horizontal impressions made using the same comb; and a short stretch of very shallow linear impression on one sherd may indicate a slight mis-positioning of the comb at one point. There is no sign of any deliberate infill in the design; none was noted in any of the Beakers from Pit [053].

The fabric is very fine, with very few inclusions; the overall inclusion density is below 5%, and most fragments are below 3 x 3 mm in size, although there are a few larger, rounded and sub-angular inclusions, up to 6 x 5.5 mm in size, all of locally-available stone types. The latter may have been present naturally in the clay, rather than deliberately added as a filler; why such visually-intrusive inclusions had not been removed is a mystery. Something that was

deliberately added, however, was small fragments of crushed pottery, or 'grog'. Its significance will be discussed below.

This vessel is of an international, 'Epi-(or 'Variant') Maritime Bell Beaker' style that was particularly widespread on the Continent from around the 25th century BC (see Needham 2005 and Salanova 2000 for recent discussions). According to the latest typochronological scheme for British Beakers as produced by Stuart Needham (2005), despite its sinuous profile this pot would fall within his 'low-carinated (LC)' class of early, international-style Beakers (Needham, pers. comm.). According to older schemes, Clarke (1970) would class it as a 'European' Beaker; Case (2001) would regard it as Early and as part of his 'Group D' Beakers, closest to Atlantic European style; and Lanting and van der Waals would, in a British context, allocate it to their 'step 1' or 'step 2' (1972).

A sherd from Pot 1 was analysed to determine whether any absorbed lipids were present. None was found.

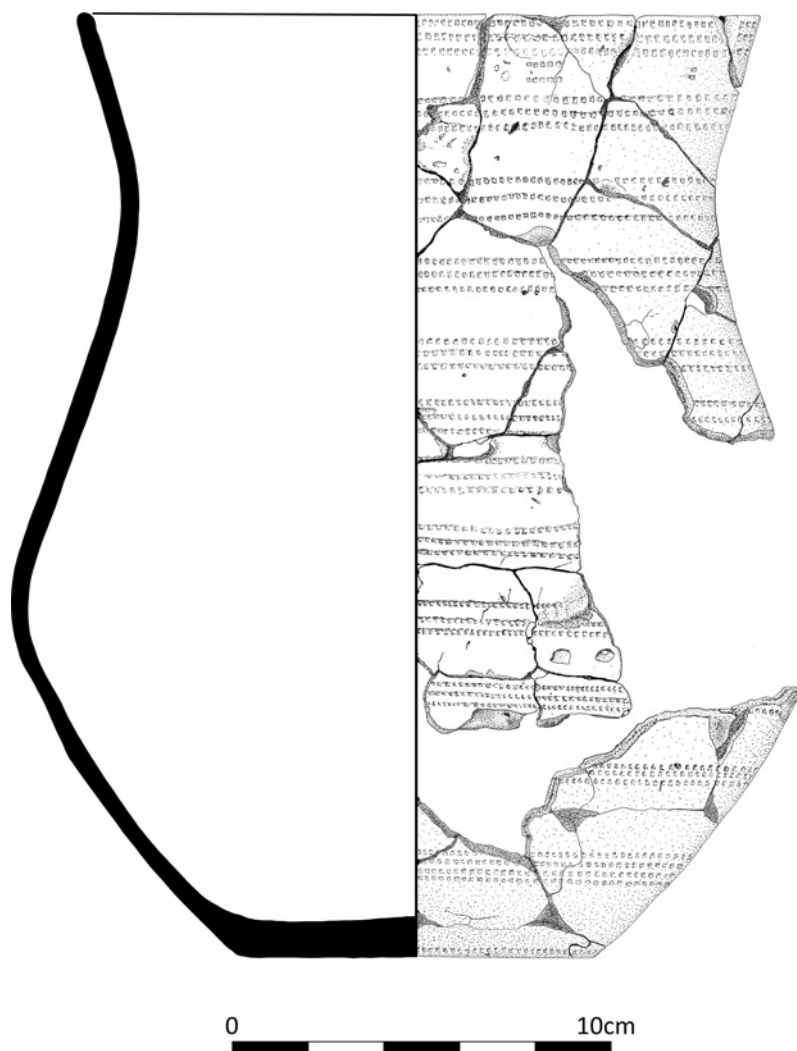


Fig. 10.
Pot 1: Epi-Maritime Bell Beaker

POT 2 (SF 5)

This is represented by its lower part – constituting just over a half of the vessel – together with six conjoining rimsherds and a neck sherd that had been found in the immediate vicinity. These sherds conjoin with the rest of the body, to produce a complete profile on one side of the pot (Fig. 11). Although smaller and squatter than Pot 1, and differently decorated, Pot 2 shares many characteristics in common with it: its sinuous profile and low, full belly that reaches its widest point just below a third of the vessel's height; a gently squared-off rim and splaying neck; the absence of a clear

junction between the base and the belly on the interior; the use of grog as a filler; thin walls, fine texture, and high quality of manufacture. Its overall height is 126 mm; the estimated rim diameter is *c.* 140 mm; the maximum belly diameter, 120 mm, and the base diameter, 68–70 mm. Wall thickness ranges from 5 mm at the rim to *c.* 10 mm at the base. The rim is gently squared off and the base is flat on the interior and slightly concave on the exterior. The exterior is a slightly mottled orange-buff (with one grey-buff firing 'cloud' on a rimsherd); the interior is a lighter orange-buff; and the core is black, again indicating rapid firing. There were no obvious traces of the pot's former contents; brownish material on the interior at the upper belly

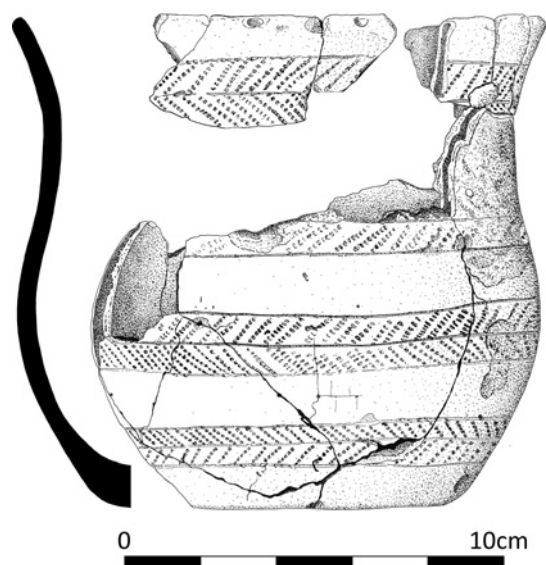


Fig. 11.
Pot 2: Cord-Zoned Maritime Bell Beaker

probably derives from the sediment that had fallen into the pot. Lipid analysis was not undertaken on this vessel.

The vessel had been built up in the same way as Pot 1 and once again, the surfaces had been very carefully smoothed (and possibly slipped) prior to decoration of the exterior. Tiny scratch marks on the exterior below the rim suggest that the surface had been scraped and there is one area, at the neck and upper belly, where the exterior had been polished to a medium sheen, creating (or enhancing) the slip-like effect. Abrasion to this part of the pot on one side has led to the spalling off of some of this polished surface. Originally, it is likely that all the plain zones on the exterior had been polished. The exterior is decorated with a zoned design featuring blank zones interspersed with four bands of impressed herringbone decoration. Each herringbone zone consists of opposed diagonal comb-impressed lines, made using a narrow (*c.* 1.1 mm) comb around 13 mm long, with rectangular, closely-set teeth. These are framed top and bottom by a narrow horizontal line of loosely-twisted cord impression, and there is a further cord-impressed line where the 'herring bones' meet. (At one point on the second zone up from the base, the comb used to make the diagonal herring bone impressions has been used instead of the cord to complete or 'refresh' the line.) The comb used to decorate this pot is not the same as the one used on Pot 1. As with Pot 1, the exterior had been given a final wipe prior to firing, slightly smudging the decoration at some points.

As with Pot 1, the inclusions in the fabric are sparse (<5% density) and mostly small, although there is one incongruous-looking rounded pebble, *c.* 11 x 8 mm, protruding through the exterior just below the rim. This

recalls the occasional large inclusions in Pot 1. Other lithic inclusions – which are probably locally-derived – include a rounded fragment of quartz. Two small, red fragments of grog are also visible. In addition, there are traces of several burnt-out organic inclusions, which were probably accidentally incorporated in the pot: one small straw or grass impression, and three cereal grain impressions (one, oblique, on the inside of the belly and two on the outside, including one with its ventral ridge visible). Examination has suggested that the impressions are probably of barley (*cf. Hordeum* sp(p.): J. Robertson, pers. comm.).

This vessel would fall into the same general type as Pot 1 – that is, an 'Epi- (or Variant)' Maritime Bell Beaker; Stuart Needham (pers. comm.) places it within his 'Low Carinated' class, rather than in his 'S-profiled' class. However, it represents a specific type of maritime Bell Beaker – a 'Cord-Zoned maritime' (CZM) Beaker – which is especially rare in Britain. Continental parallels (discussed further below) include Dutch specimens from among Lanting and van der Waals' 'maritime bell Beakers of type 21a' (1976).

The condition of this pot, and the fact that it was found upright, indicates that it suffered far less from the collapse of the putative wooden grave chamber than did the other two Beakers in the grave. It might have been dealt a glancing blow. The condition of the surviving rim fragments is better than the condition of the neck to which they conjoin, indicating that they were protected from abrasion by their fall. This, and the fact that the fracture surface around the pot is mostly slightly abraded, confirms that the damage to the pot is ancient.

POT 3 (SF 6)

Virtually complete all-over-cord-decorated (AOC) Beaker, reconstructed from 76 sherds. The profile is sinuous, with a splaying, squared-off rim, a long, fairly straight upper body and a very gentle low carination just below one-third of the vessel's height (Fig. 12). The base is minimally dished on the outside and flat on the inside, with no crisp junction between base and belly on the inside. The vessel's height is 165 mm; the rim diameter *c.* 150 mm; diameter at carination *c.* 143 mm; base diameter *c.* 80 mm; and the wall thickness ranges from 4.7 mm at the neck to *c.* 10 mm at the base. The exterior is a light brick-red colour, slightly mottled with buff, and with a light grey fire cloud at one point. The interior is a yellowish-buff; and the core is black.

The pot had been built up in the same way (and with the same skill and care) as Pots 1 and 2, with horizontal (and some diagonal) break lines indicating the position of strap joint lines. The surfaces had been exceptionally well-smoothed, especially on the interior, and on the base are small facets, suggesting the use of a pebble as a smoother. Faint scrape lines are visible on the interior, as are slight irregularities where the wall was manipulated with the fingertips. The surfaces had either been slipped, or else carefully wet-smoothed to create a slip-like effect. One irregularity in the interior surface results from the burning-out of a piece of flattened straw or grass that had probably been incorporated accidentally into the fabric. The decoration, which covers the whole of the exterior from

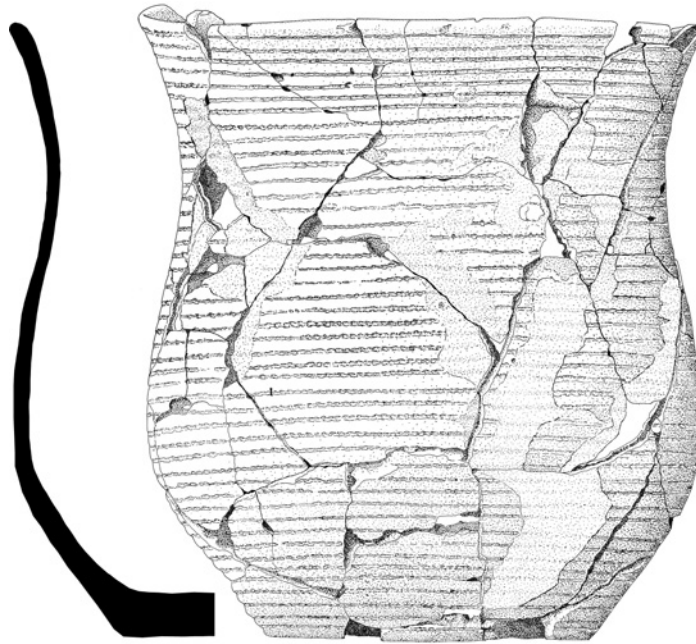


Fig. 12.
Pot 3: AOC Bell Beaker

immediately below the rim to immediately above the base, was effected by wrapping a long, S-twisted cord carefully around the vessel before the clay had dried, to create an almost imperceptible spiral; the impressions are *c.* 1.3 mm wide and spaced 2.5–4 mm apart. To create the impression of horizontal lines, the cord would have been wrapped around the pot a few times, then lifted and moved to create the next set of impressions (Hammersmith, pers. comm.); it appears to have been wrapped clockwise, implying a right-handed potter. That a final smoothing of the surface took place after the cord-impression had been done is clear from a slight smudging of the impressions at several points. There are areas of post-depositional abrasion on the exterior, and the surface has spalled off at a couple of points, and is friable at a couple of other points. The abrasion relates to post-depositional conditions in the grave. Like Pot 1, this Beaker must have been knocked over and crushed when the wooden grave structure collapsed. However, unlike Pot 1, it was not distorted by its crushing: reconstruction to its former shape has been possible.

As with Pots 1 and 2, the fabric is again very fine, with very sparse inclusions (at a density of *c.* 3%). The largest is a small rounded pebble, around 8 mm long, which may have been present naturally in the clay; this is reminiscent of the large inclusions in Pots 1 and 2, and again why the potter did not remove this is unclear. A few, very small fragments of grog are also present.

Once more, Needham places this pot within his category

of ‘Low Carinated Beakers’ (Needham, pers. comm.). According to Clarke’s (1970) scheme, it is an ‘All Over Corded’ (AOC) Beaker; it is ‘Early’, according to Case (2001); and it belongs within Lanting and van der Waals’ (1972) ‘step 1–2’.

A sherd from Pot 3 was analysed to determine whether any absorbed lipids were present. The techniques used were high temperature-gas chromatography; gas chromatography/mass spectrometry; and gas chromatography combustion-isotope ratio mass spectrometry. A positive result was received, indicating the former presence of ruminant dairy fat, probably in the form of milk.

THE FLINT ARTEFACTS FROM PIT [053]

A single edged flake knife (Fig. 13, SF 7a) and a double ended fabricator or strike-a-light (Fig. 13, SF 7b) were found close to Pot 3 at the southern end of the feature. The fabricator or strike-a-light, 41 mm long, is made on a thick tertiary blade of pale grey good quality non-local flint, possibly from Antrim, in north-east Ireland. The artefact is complete and both lateral edges have been modified along their full length by the application of regular, semi-abrupt, semi-invasive scaled retouch. There is evidence of extensive abrasion of both the proximal and distal terminals, and although the object is not patinated, its surface has been worn smooth with use. These features indicate that the artefact had seen considerable use before its burial.

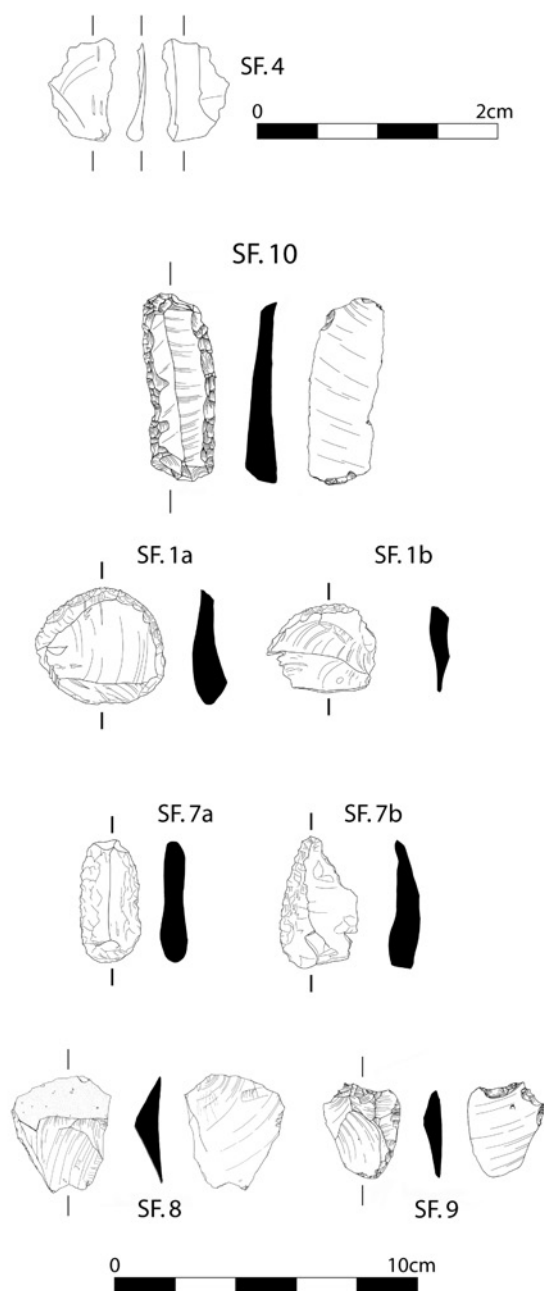


Fig. 13.
Lithics from Upper Largie: SF10 from Pit [303]; SF 1a & b
from Pit [053]; SF4 from Cist 3b); SF7a & b from Pit
[004]; SF8 & SF9 from the topsoil

The knife (SF 7a), also 41 mm long, is made on a tertiary, triangular rejuvenation flake of honey coloured flint. The artefact is complete and unpatinated, with prominent removal scars visible on the proximal dorsal face. A pronounced bulb of percussion is visible on the ventral face. The platform remains intact and appears faceted. The artefact has regular, semi-abrupt scale-flaked retouch along its entire left edge. The right edge is unretouched but shows signs of use, in the form of slight irregular flake scars on both faces.

The discovery of these two flint artefact types together can be paralleled in other Bell Beaker graves, both in Britain (eg, at Newmill, Perth & Kinross: Watkins & Shepherd 1978) and on the Continent; in the Netherlands, Drenth and Lohof (2005, 443) have observed that they are associated with male graves. This may therefore indicate that the individual buried at Upper Largie was a man.

EARLY BRONZE AGE GRAVES AND STRUCTURES

Activity dating to between the 22nd century BC and c. 1500 BC is attested by a series of graves, discovered at various times and in various locations on the terrace between 1982 and 2005, and three structures that may post-date these: a pit, surrounded by a ring of other pits or post-holes, superficially similar in appearance to the early Beaker grave; a timber circle; and a post row. These features will be described in chronological order as far as can be determined.

Graves

These comprise a grave that had probably contained a wooden 'cist', located immediately next to the Early Beaker grave described above; seven stone cists, three found at the northern part of the terrace between 1993 and 1997, and four at the southern end, excavated in 1982 and 1983; and a pit containing a Collared Urn, found in 1983 close to one of the cists. A deposit of cremated bone, found under a slab in one of the pits of the pit-and pit/post-ring structure during the 1993 excavations, might also be of Early Bronze Age date but its current whereabouts cannot be traced.

PIT [132]: GRAVE, PROBABLY WITH WOODEN 'CIST', BESIDE EARLY BEAKER GRAVE

A sub-rectangular pit [132] was identified during the 2005 excavation (Fig. 7), to the immediate east of Pit [053] in the northern part of the terrace, and truncating the eastern edge of Pit [053]'s ring ditch and tree-throw hole. Aligned north-south, the pit measured 3.50 m by 2.10 m east-west

and was up to 0.76 m deep. The sides of the cut were straight, as was the base (Fig. 7). The upper fill [129] consisted of a brown sandy silt with frequent inclusions of large pebbles. The primary fill, a dark grey-brown silt, contained a footed Food Vessel (Pot 4) which was standing upright and full of sediment. There was no evidence for a stone cist or wooden lining within the pit, nor was there evidence of human remains although, as argued in the discussion below, it seems likely that this had indeed been a grave, probably with a rectangular wooden plank-built 'cist', to judge from the shape of the cut.

Although 25 fragments of oak charcoal were recovered from the pit's upper fill [129], this material was considered unsuitable for dating because the taphonomy of the context was not absolutely clear and the oak could present 'old wood' problems (see below). The charcoal is thought to derive from a fuel dump. No datable material was recovered from the contents of the Food Vessel although, as stated below, the vessel can be dated, from reliably-dated Irish comparanda, to the 22nd or early 21st century BC.

The Footed Food Vessel from Pit [132]

This unique vessel is a globular ridged bowl of Irish style, with four protruding feet – a Yorkshire trait, as will be discussed below. Found upright but slightly crushed, it is now virtually complete but with some deep cracks. The rim is flat and gently squared off, its outer edge protruding slightly, and below it the upper part of the bowl is divided into three concave-walled sections by two cordon-like ridges (Figs 14 & 15). There is also a much lower ridge, further down the body on the lower belly. The four feet are stubby and round in cross-section; they are fairly closely spaced, and they protrude from a gently curving base. The rim diameter is c. 150 mm; the height, 115 mm; the wall thickness range, 8 mm–10.7 mm; and the length of the legs c. 12.5 mm. The exterior is a buff to light brown colour, slightly reddish in parts; the interior, mottled buff and grey-buff; and the core, medium grey.

Lithic inclusions are markedly more abundant than in the Beakers described above, with an estimated density approaching 7%. They are mostly smaller than 1.5 mm, and they represent a combination of finely-crushed filler and material naturally present in the clay. In each case, the stone had been obtained locally.

The surfaces had been smoothed carefully, but on the interior the numerous tiny lithic inclusions impart a slightly rough feel. The whole of the exterior, below the rim, is decorated with a dense design, executed by incision and impression. The exterior edge of the rim, and the cordon-like ridges, has short vertical incisions. Between these, and below the lowest ridge, are zones of horizontal impressions that look to have been made with a blunt comb; where individual impressions are clearly visible, they are c. 28 mm long and elliptical in shape. Framing each of the ridges, above and below, is a line of false relief, executed with a pointed semi-circular spatulate tool. Further down, on the belly, two more of these lines frame an area of dense vertical impressed lines, probably made with the same tool as the

other linear impressions. Below this is the very low ridge, and the bottom of the belly has roughly horizontal lines of impressions that extend around and between the feet, making a cruciform design as they cross between the feet.

The contents of the vessel were excavated in a laboratory. A greasy black layer with no mineral inclusions was found to overlie a layer of pebbles at the base of the vessel. Soil chemical analysis demonstrated that the sediment within the vessel was significantly different from the other sediment in the pit, in that it was highly organic in character. Both lipid and pollen analyses were undertaken to determine the nature of the deposit. There was no lipid fraction present, so it is unlikely that the deposit contained an animal fat or plant product, such as an oil, resin, or wax. The vessel's original contents could have been sugar-based, for example honey or mead, but as only trace amounts of poorly preserved pollen were present, this hypothesis cannot be tested further.

Of the ten pebbles examined, nine are water-worn and of rock types typical of the bedrock geology of the area. As such, they would seem to be a typical handful of local stream or gravel pebbles. The location of the archaeological site within a gravel deposit suggests that the pebbles are most likely to be derived from the deposit itself. The only possible exception is a fragment of pitted rock of unusual lithology and uncertain provenance. The concentration of pebbles in the base of the pot suggests that they may have been deliberately deposited in it, although one cannot rule out the possibility that they represent naturally-sorted sediment following the ingress of sediment (deliberate or otherwise) into the grave.

CIST MR (MERCER & RIDEOUT) 3

Located at the southern end of the terrace (Fig. 2), this small cist, measuring 0.40 m long, up to 0.28 m wide and 0.40 m deep internally, was excavated in 1982 and is described more fully and illustrated in Mercer and Rideout's report (1987, 30 & fig. 6). A small amount (58 g) of cremated human bone from a mature individual was found, mixed with charcoal-rich soil, both inside the cist and between the cist and the edge of its pit. No grave goods were present. A radiocarbon date of 3595±70 BP (GU-1978, 2140–1750 cal BC) was obtained from mixed species charcoal in the 1980s; more recently, the cremated bone was dated to 3645±35 BP (SUERC-16633, 2140–1920 cal BC).

CIST 3

Excavated in 1997, this cist was on the northern part of the terrace, lying just west of the western arm of the cursus (Fig. 2). Fragments of what had probably been its capstone were found scattered upon and around the cist; it had been broken prior to the machine removal of topsoil, and the contents of the cist appeared to have been disturbed. The cist comprised two side-slabs held in place by two end-slabs, all of local schist, set within an oval pit 1.70 x 1.15 m and 0.55 m deep (Fig. 16). It was oriented north–south and measured 1.04 m in length, 0.83 m and 0.61 m in width at its northern and southern ends respectively, and up to 0.52

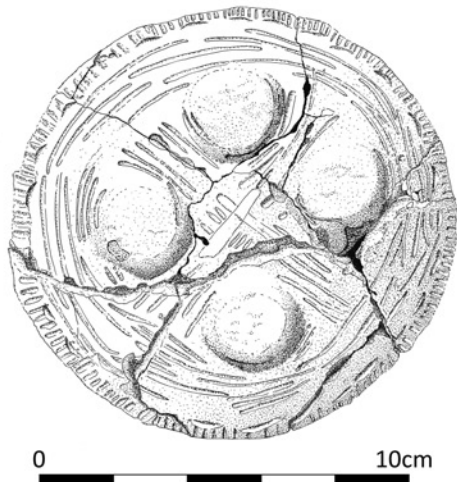
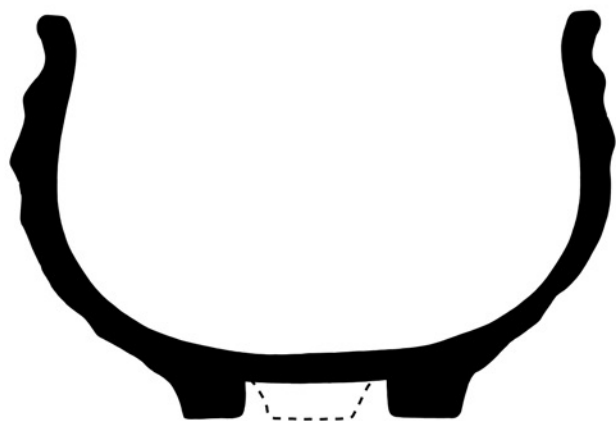
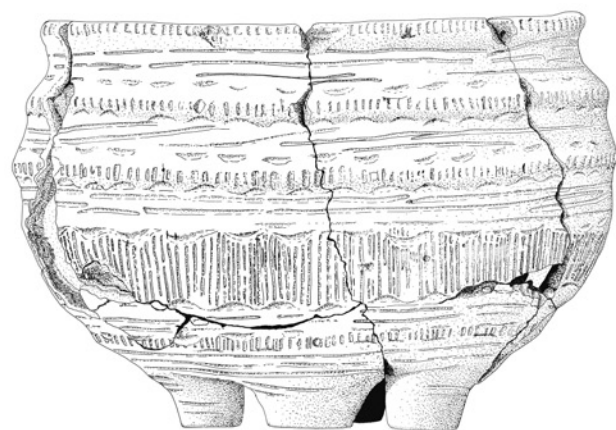


Fig. 14.
Footed Food Vessel

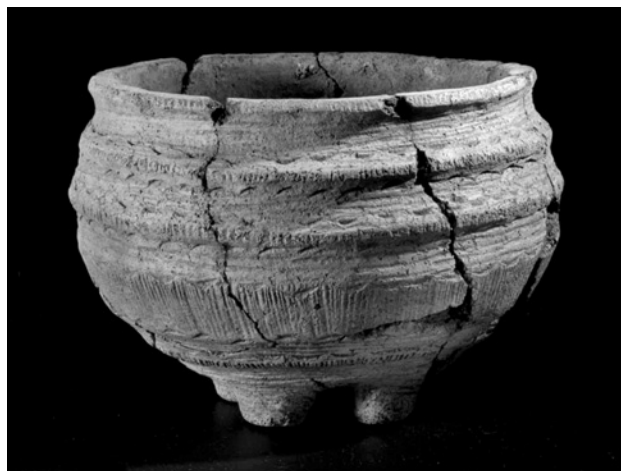


Fig. 15.
Footed Food Vessel

m in depth. The floor comprised deliberately laid pebbles of roughly uniform size [1088]. The packing behind the slabs consisted of redeposited sands and gravels. The three fills were mixed and disturbed. The cist contained the disarticulated remains of an adult female, found mostly among the silt and the overlying mixed fill but probably originally deposited on the pebble floor. The body's original position could not be determined, although if deposited intact (rather than as disarticulated remains) it must have been buried in a crouched position. A rim sherd, two body sherds and six fragments of a comb-impressed Beaker were recovered from deposit [1087] which overlay the layers containing the human remains, and six flint artefacts were found in the cist fill.

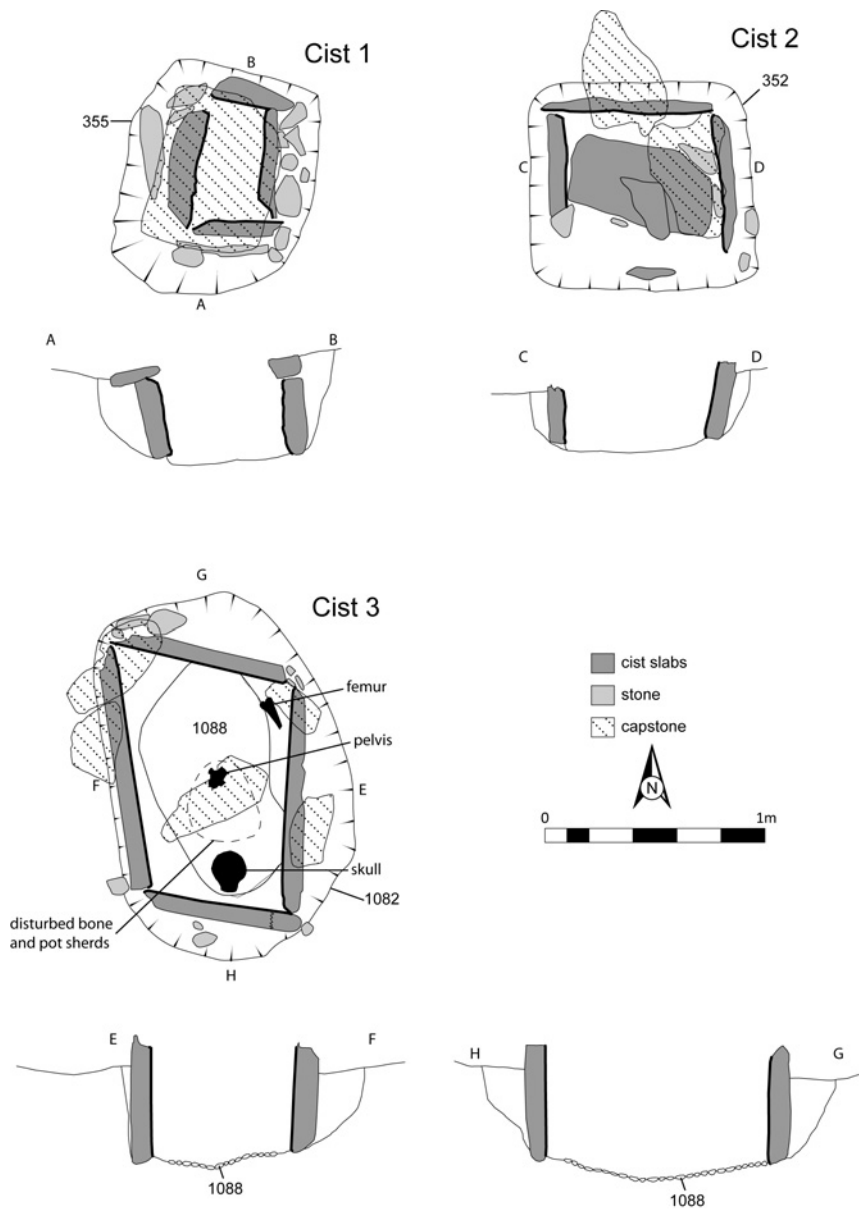


Fig. 16.
Plan of Cists 1-3

The human remains

These comprise a fairly well preserved skull and post-cranial elements in very poor condition. They are considered to be those of an adult woman in her twenties or early thirties. No pathology was noted in the fragmentary bones or in the dentition, except for a trace of calculus on some of the teeth. The right ilium has a wide greater sciatic notch and a long and moderately deep preauricular sulcus. The fragments of

post-cranial skeleton that survive are gracile. The cranium appears small and lacks pronounced features, having a small and smooth right mastoid process and a vertical frontal bone with unpronounced brows. The absence of marked cranial features, the gracile post-cranial remains and particularly the pelvic features indicate that the remains are those of a woman (Bass 1986; Phenice 1969). The right auricular surface indicates the woman's age fell within the

25–34 year category (Lovejoy *et al.* 1985). The wear on the maxillary molars corresponds to that of the youngest of Brothwell's (1981) age categories (17–25 years) as does that on the four mandibular teeth.

The Beaker

The rim sherd is from a coil-constructed vessel with N-shaped junctions. The body sherds and six fragments appear to be slipped on the exterior. The rim is gently squared off with a diameter of 220 mm and a wall thickness of 9 mm. The fabric is fine sandy clay with 30% of angular rock fragments. The fabric is hard. One of the sherds is a spall representing the warped outer surface of the vessel, only about 2 mm in thickness. The rim sherd is decorated on the exterior surface with two comb-impressed lines, the first 11 mm below the lip of the vessel, with the second line 5 mm below that (Fig. 17a). The spall has traces of two comb-impressed lines. The rim form and decoration indicate that these sherds are from a Beaker, but too little of the pot survives to allow more precise classification.

Lithics

A core, two scrapers and three large flakes were recovered from the fill of Cist 3. The single bipolar core (SF 5, from the upper fill) is on a primary flake, which suggests that core reduction and tool-making may have been undertaken on-site, although there are no tools or flake debitage of the same material. The side-scraper, SF 9 (Fig. 13), is made on a thin inner flake of high quality yellowish-brown flint, while another scraper, SF 8 (Fig. 13) is made on a secondary flake of beach pebble flint. This is an *ad hoc* tool where a step termination has been modified by partial retouch to form the slightly convex scraper front. Both scrapers show signs of heavy use. This appears as rounding of scraper edge and of the ridges between retouch scars, consistent with the use of these tools for hide or leather working (*cf* Rosenfeld 1971). There are no signs of resharpening. Three large flakes (SF 6, 7, and 14; not illustrated), all 31–8 mm long, of apparently identical (beach pebble) flint were retrieved from the lower and middle fills of Cist 3. These are all secondary removals, possibly from same block of material, although no conjoins were found.

Human bone

A human adult femur recovered from Cist 3 was radiocarbon dated, producing a date of 3590±40 BP (GU-9358, 2120–1780 cal BC; Table 1). Isotopic analysis of a second mandibular molar and a skull fragment from this individual was undertaken by Mandy Jay, Janet Montgomery, and Maura Pellegrini as part of the *Beaker People Project* (Jay & Montgomery 2008; Project label 'SK 316'). Strontium and oxygen isotope analysis of molar enamel revealed that the woman had probably grown up in Scotland, possibly locally, and carbon and nitrogen isotope analysis of collagen from

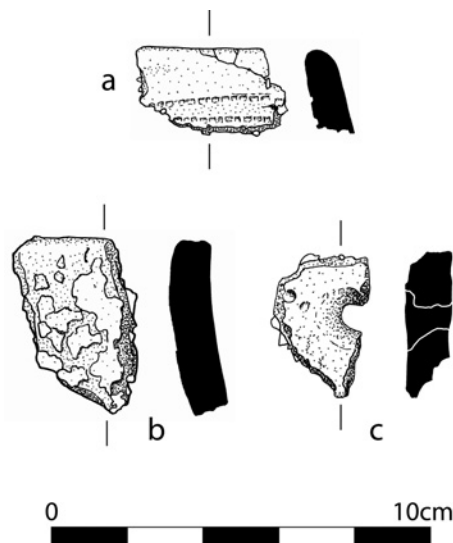


Fig. 17.
a. Beaker from Cist 3; b. Flat-rimmed pottery from [104]

the bone and dentine indicated that she had eaten a diet dominated by terrestrial resources, despite the proximity of Kilmartin Glen to the sea. Like her contemporary counterparts elsewhere in Britain and Ireland, she does not seem to have eaten fish, shellfish or marine mammals in recordable amounts at any point during her life.

CIST 1

Excavated in 1993, this cist lay to the west of the 'avenue', close to the very southern edge of the area that was excavated that year (Fig. 3). Its capstone, a flat sub-rectangular slab measuring 0.56 x 0.78 m, was found immediately below the topsoil. The cist comprised two side-slabs, held in place by end-slabs set within an irregular, steep sided pit, orientated north–south (Fig. 16). At the northern end an upper rectangular slab covered a lower angular slab, the placement of the former reducing the upper internal size of the cist. A sub-rectangular stone had been placed across the south-west corner to level the capstone. The western side-slab was not set perpendicular to the end slab. The voids behind the slabs were packed with cobbles, sub-rectangular stones, sand and gravel, and some silt. The cist measured internally 0.48 m long and 0.34 m wide, narrowing to 0.26 m at the northern end, and was 0.45 m deep. Its floor consisted of natural sand and gravel. The upper fill consisted of what was probably redeposited ploughsoil and the lower fill consisted of a more compact silt loam with stones and charcoal, including 15 pieces of unworked small and medium (12–53 mm) sub-angular to

sub-rounded stones ('pebbles') of vein quartz, quartzite, and mica-schist. A complete Food Vessel was recovered from the lower fill in the south-east corner of the cist; it had been standing upright on the floor of the cist, and was full of earth and stones (Haynes 1993).

The Food Vessel

Bipartite Vase Food Vessel (Fig. 18), virtually intact, lacking only a small area of rim, and with four areas of abrasion on the rim (including the fracture surface) and some cracks of variable severity. The rim is internally bevelled; the neck is upright and fairly straight, kinking out to a carination about two-thirds up the body; and the belly tapers to a pedestalled flat base. The outside of the neck and upper belly is decorated with rows of fingernail impressions, those lying on the carination being more neatly executed than the rest. The lower belly is decorated with diagonal, partly criss-crossed lines which have been incised with a sharp-pointed implement. The rim bevel has a row of impressions made with a triangular-shaped point, and the outer edge of the rim is decorated with fingernail impressions. The decoration is far cruder than that seen on the footed Food Vessel described above. The exterior and interior surfaces are a mottled buff/grey, and the core is dark grey, indicating a rapid firing. The surfaces had been slipped, but the sizeable stone fragments forming the filler protrude through the surface. There are light patches of sooting that are likely to relate to the pot's firing, rather than to any use as a cooking vessel.

The combination of a lack of suitable material and the likelihood of contamination meant that no radiocarbon dates were sought for the cist. However, on the basis of our current understanding of Scottish Food Vessel chronology, it is likely that the cist dates to around the 20th century BC: a similarly-shaped vessel from Barns Farm (grave 2), Fife, with similarly rough decoration, has been dated (from associated cremated bone) to 3605±45 BP (GrA-24190, 2140–1920 cal BC: Sheridan 2004a, 268 and fig. 81.2).

OTHER CISTS: CIST 2 AND CISTS MR 1, MR 2 AND MR 4

These four cists, Cist 2 being excavated in 1993 on the northern part of the terrace and the others being excavated in 1982 and 1983 on its southern part (Fig. 2), were all devoid of human remains and grave goods when discovered but are likely, from their general similarity and proximity to the cists described above, to be of Early Bronze Age date. Those excavated by Mercer and Rideout have already been published (Mercer & Rideout 1987) so will not be described further here, except to note that their Cist 2 had previously been investigated by J. Hewat Craw in 1929 (Craw 1930, 142–3) and their Cist 4 had been emptied at some unknown point in the past.

Cist 2, excavated in 1993, lay to the south of the pit and post-ring feature and north of cist 1 (Fig. 3). The capstone was broken into three large and many smaller pieces during the topsoil strip. Its original size has been



Fig. 18.
Bipartite Food Vessel from Cist 1

estimated as 0.68 m long and 0.60 m wide (Fig. 16). Its walls consisted of three slabs of local schistose stone and it was oriented north-north-east to south-south-west. The southern side-slab was absent, but angular fragments of schist within the fill were interpreted as having belonged to it. The cist measured internally 0.70 x 0.70 m and 0.38 m deep, with a sand and gravel floor. The voids behind the slabs were packed with redeposited silt and gravel. The cist was placed within a roughly square, flat-based pit 0.90 x 0.87 m and 0.50 m deep. The cist's upper fill comprised a silt with pebbles and angular fragments of schist; its lower fill was of the same material, but more compact. No artefacts or skeletal remains were recovered and no radiocarbon dates were produced.

GRAVE CONTAINING CINERARY URN FRAGMENT
AND CREMATED REMAINS

This grave, Mercer and Rideout's 'Feature 1' (1987, 30–1 and fig. 10.7–8), was discovered in 1983 at the southern end of the terrace (MR grave pit: Fig. 2), and consisted of the base of a cinerary urn which must have been buried upright in a pit, together with 463 grams of cremated bone from a mature adult, probably male. Green staining on some of these bones suggested the former presence of a copper or copper alloy object, and a burnt flint plano-convex knife was found inside the urn. The cremated bone was radiocarbon dated in 2008 to 3520±35 BP (SUERC-16631, 1940–1750 cal BC). This date, and the narrowness of the urn base, suggests that it is most likely to have been a Collared Urn.

The Pit and pit/post-ring Complex

During the 1993 excavations a large pit [332], surrounded by an irregular ring of at least 17 pits or post-holes (Fig. 19), was identified straddling the southern end of the cursus and intersecting with the large timber circle. Some pits may have been dug within the post-holes of the cursus and were subsequently not recognised as such during excavation; for instance, one might have been dug with post-hole [324], between Pits [325] and [323] (Fig. 19). There was no clear stratigraphic relationship between the pit and pit/post-ring complex and the timber circle.

The central pit measured 6.80 m in diameter and was up to 1.80 m deep (Fig. 20). The basal deposits comprised up to 0.65 m of various matrix-supported gravels [514–516, 518, 579–584] which slope towards the base of the pit indicating that it was either deliberately or naturally backfilled. (The rapidity of natural backfill was appreciated during a site re-visit just over one year after excavation, when those post-holes cut into relative loose gravels and grits were less than half their excavated depth.) The pit had been recut at some stage and up to 0.50 m of peat [512] containing occasional cobbles, and waterlogged fragments of hazel, oak, alder, rowan, and *Pomoideae* (apple/hawthorn-type fruitwood) roundwood had subsequently accumulated. This was overlain by a 0.25 m layer of dark, well-humified peat [495] from which waterlogged roundwood was also recovered, and above this was 0.30 m of peat loam [337] mixed with cobbles. The upper fill [331] comprised loosely packed, redeposited cobbles amongst which were fragments of clay pipes, suggesting that this feature was visible as a hollow, well into the 18th century. No other finds were retrieved from this pit.

The central pit was surrounded by an irregular ring of pits. The pit-ring had a diameter of approximately 11 m and was off-set in relation to the central pit (Fig. 19). The pits lay on average 1.97 m apart, or 1.87 m apart if Pit [380] is included, although the greatest distance occurred between Pits [320] and [319] which were 4.18 m apart. In plan Pits [319] and [320] lay off-set from the ring by approximately 1 m. It is unclear whether Pits [380] and [609] were part of the complex. In general the pits were roughly oval in shape and measured between 0.37 x 0.49 m to 0.95 x 1.05 m and 0.22–0.49 m deep (Fig. 21).

The pit fills comprised various stony silt and sand loams and sands and fine gravels (Fig. 21). There are indications that at least some pits may originally have held posts: possible stone packing was observed in Pits [327], [330], and [320] (although the natural accumulation of stones cannot be ruled out), and oak charcoal was found at the bottom of Pits [326] and [329].

One of the pits, [321], contained a horizontal stone slab at a depth of 0.15 m and directly beneath the slab was a concentration of burnt bone, presumed to relate to the cremation of a person. (This bone was subsequently mislaid, and no osteological analysis had been carried out so its identification as human remains is an assumption.) It has been suggested that the cremated bone may have originally been held within a bag or pouch (Radley, pers. comm.). There was no evidence of a recut of the pit for the insertion of the cremated bone and stone slab.

A total of 174 pieces of waterlogged wood from Pit [332] have been identified (Table 2). The majority of the material is unworked roundwood but a number of pieces displayed chop-marks at one end. At least six pieces of oak are woodworking offcuts, one of which is partially charred. One oak offcut has very clear woodworking facets which demonstrate the use of a narrow-bladed metal axehead with a somewhat curved cutting edge. The facets have a dished cross-section which would rule out the use of an iron shaft-hole axe. More precise identification of the axe type is not possible. The ages of the hazel roundwood were recorded by ring-count to determine the type of woodland from which it had come. The bulk of the hazel was either too fragmented or too decayed to examine and only 49 pieces, or 38% of the sample, could be counted. The material displayed a narrow age range, from 3 to 11 years, with a peak at 6 years, indicating that young coppice stools were available. It

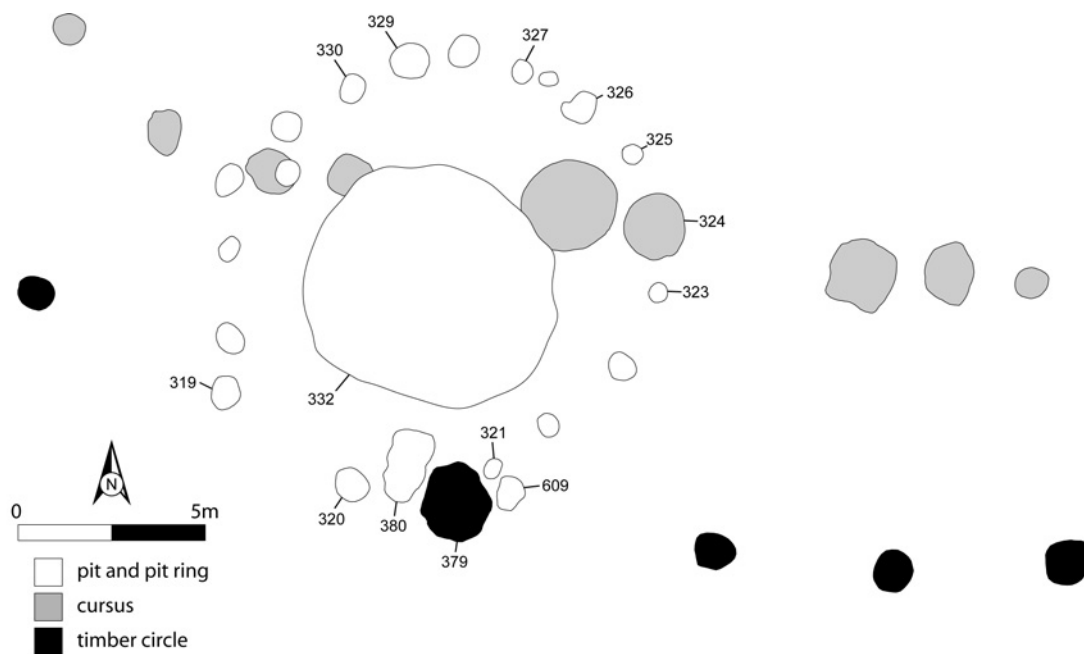


Fig. 19.
The pit and pit/post-ring complex

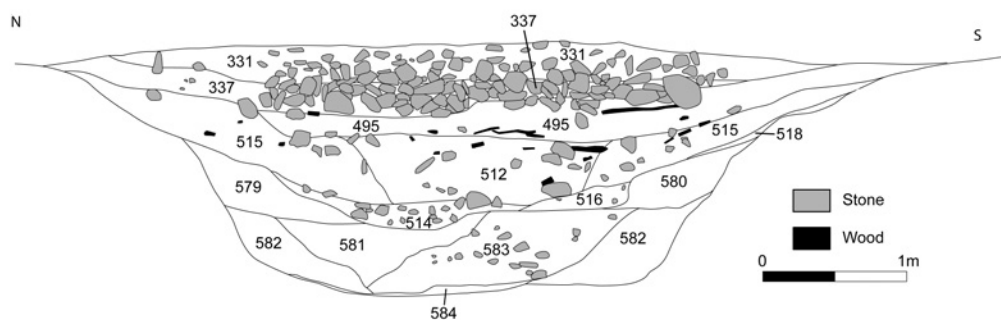


Fig. 20.
Section through Pit [332]

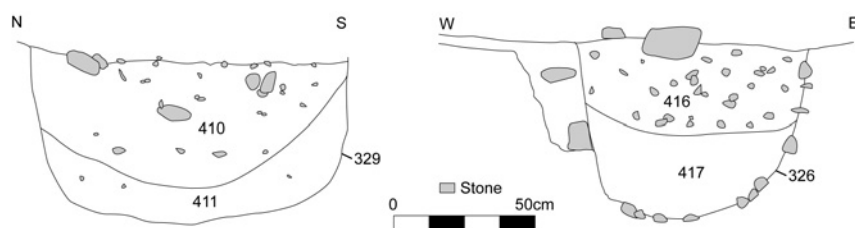


Fig. 21.
Representative sections through pits in the pit/post-ring complex

TABLE 2: THE WATERLOGGED WOOD FROM PIT [332]

Taxon	No. frags	% assemblage
Hazel (<i>Corylus avellana</i>)	127	73
Oak (<i>Quercus</i> sp.)	22	13
Alder (<i>Alnus glutinosa</i>)	17	9
cf. Rowan (<i>Sorbus</i> sp.)	4	3
Pomaceous fruits Pomoideae	2	1
Unidentified	2	1

was not possible to say whether the coppice was deliberately managed or had been created by adventitious cropping.

Two waterlogged samples, one of oak and one of alder roundwood (*Alnus glutinosa*) from the central pit were radiocarbon dated, producing dates of 3350 ± 45 BP (GU-9362, 1740–1530 cal BC) and 3390 ± 60 BP (GU-9363, 1880–1530 cal BC) respectively (Table 1). Oak charcoal from Pits [326] and [329] was also radiocarbon dated, to 3570 ± 45 BP (GU-9778, 2030–1770 cal BC) and 3645 ± 45 BP (GU-9779, 2140–1900 cal BC) respectively. The disparity between these dates and those from the central pit may be due to an ‘old wood’ effect in the use of oak charcoal. However, the recutting of the central pit and the development of at least 0.75 m of peat implies some longevity in the use of the complex.

The timber circle

The remains of a large post circle, measuring 45–7 m in diameter, were recorded over the southern end of the cursus (Figs 3 & 22). The circle comprised 29 post-holes, or 31 if post-holes [319] and [320] are included in its circuit. (It is unclear whether these belong with the pit and pit/post-ring complex.) A further post-hole is suspected to have existed between [372] and [1105] but was lost to the quarry face. The post-holes were U-shaped in section with steep sides and slightly concave bases (Fig. 23). Width ranged from 0.70 m to 2.09 m and depth 0.35–0.85 m. The fills fall into five broad sediment types comprising orange/brown sands with silt, pebbles, cobbles, and occasional charcoal; clast supported gravels; grits; matrix (silt) supported gravels; and greyish-brown silts and sands, some organic and charcoal rich. Three post-holes, [342], [343], and [3032], contained degraded *in situ* timber posts (Fig. 23). Post-pipes were observed in a further 18 post-holes. The distances between the majority of post-holes (measured from centre to centre of post-pipe, or

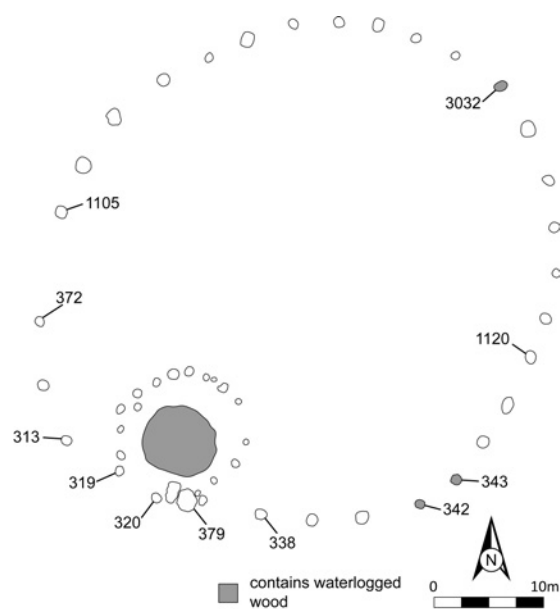


Fig. 22.
The timber circle

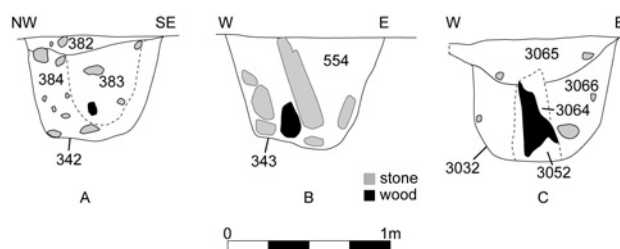


Fig. 23.
Representative sections through post-holes of
the timber circle

centre to centre where no post-pipe was observed) ranged between 3.51 m and 5.92 m (with allowance made for the missing post-holes). However, in the area where the circle and the pit and pit/post-ring complex overlap the distances became irregular in comparison; for instance there was 7.02 m between post-holes [338] and [379] and 12.23 m between [379] and [313]. Because of the density of pits and post-holes in this area it is impossible to determine whether this variation indicates an entrance into the circle or simply truncation.

Although called a circle throughout this text for ease of reference, the structure is in fact an oval or elliptical setting. Analysis of the symmetry of the post settings around 32 possible axes suggests that the major axis of this setting was disposed approximately along Axis 14 or immediately adjacent to this, the posts being set up pairwise across the major axis (Fig. 24; and see the Appendix). Far from being a poorly constructed circle, analysis suggests that the shape of the setting was intentional.

Within the circle were five pits which were up to 0.50 m wide and up to 0.30 m deep (not illustrated). Whether these features relate to the use of the main ring or the cursus remains unclear.

One small irregular flake of pitchstone was recovered during the sample processing of material from post-hole [1120]. This represents an inner removal from a blade core. The pitchstone is almost certain to have come from Arran (*cf.* Ballin 2009). Four pieces of flaked, and one chunk, of quartz were recovered from post-hole [3000]. These mainly comprise debitage. The quartz was probably obtained from the glaciofluvial gravels or local Dalradian Series rocks in the form of pebbles or lumps of vein quartz. Whether these objects were contemporary with the construction and use of the timber circle, or were residual, is uncertain.

Only two post-holes in the timber circle, [1120] and [1105], contained more than 1 g of charcoal; oak was identified in the former and a single fragment of alder in the latter. The degraded timbers that had survived in three post-holes were identified as oak. Of these, three fragments, 342/1, 343/1, and 3032/1 were deemed suitable for dendrochronological analysis in that they displayed long, sensitive, and slow-grown ring-patterns. The lengths of the measured sequences were respectively, 141, 82, and 221 rings. The sequences were cross-matched against each other but there were no significant correlations and thus a site chronology could not be constructed. This is a surprising result, given the reasonable assumption that the timbers would have been felled simultaneously, or at least within a year or two of each other, and that there would, therefore, have been significant overlap between the ring-patterns. It seems most likely that there is no correlation because there is actually no physical overlap between the ring-patterns; in other words, they come from different positions on the original radii. The surviving radii of 342/1 and 3032/1 are 0.165 m and 0.265 m, respectively. If this is compared with the recorded diameters of the post-

pipes themselves, 0.43 m and 0.38 m, it is immediately apparent that the parent timber would have been significantly larger than the surviving fragments. On the basis of the average ring-width on the surviving fragments it is possible to estimate that trees of 450–500 years in age were probably used. The three individual sequences were run against prehistoric master chronologies from northern England and Northern Ireland and against the few, as yet undated prehistoric chronologies from Scotland, but no matches were found.

Four samples of oak from four individual post-holes were radiocarbon dated, producing ranges between 3545 ± 40 BP (2010–1760 cal BC) and 3300 ± 65 BP (1740–1440 cal BC: GU-9364, 9365, 9372 and 9808; Table 1). Given the dendrochronological observations, it is possible that the circle was constructed up to 200–300 years later than these dates suggest, that is, the difference between the estimated age of the trees and the number of tree-rings present.

The post row

Five post-holes forming an irregular line were identified during the 2005 excavation (Fig. 3). The post-holes were aligned north–south over a distance of 23 m. The alignment lay slightly off the notional axis of the cursus, 18–22 m from the eastern arm and 26–29 m from the western arm. The post-holes measured 0.55–1.37 m in diameter and 0.20–0.60 m deep. In general they were sub-oval and horizontally filled by a mixture of sand and gravel. A large amount of rounded stones found in all post-holes was interpreted as packing stones for posts.

No charcoal was observed in the post-holes during the excavation. The identification of an *in situ* wooden oak post in post-hole [039] suggests that all the posts may have been left to rot *in situ*. This post was radiocarbon dated to 3395 ± 35 BP (SUERC-15118, 1870–1560 BC; Table 1); as with all the dates from oak charcoal, the possibility of an ‘old wood’ effect cannot be ruled out.

MIDDLE BRONZE AGE ACTIVITY

This is represented by: i) a grave containing sherds from an inverted Bucket Urn in a truncated pit, discovered in 1983 on the southern part of the terrace (Mercer & Rideout 1987, 31 (‘Feature 2’) and fig. 10.1–5); ii) a second pit (Mercer and Rideout’s

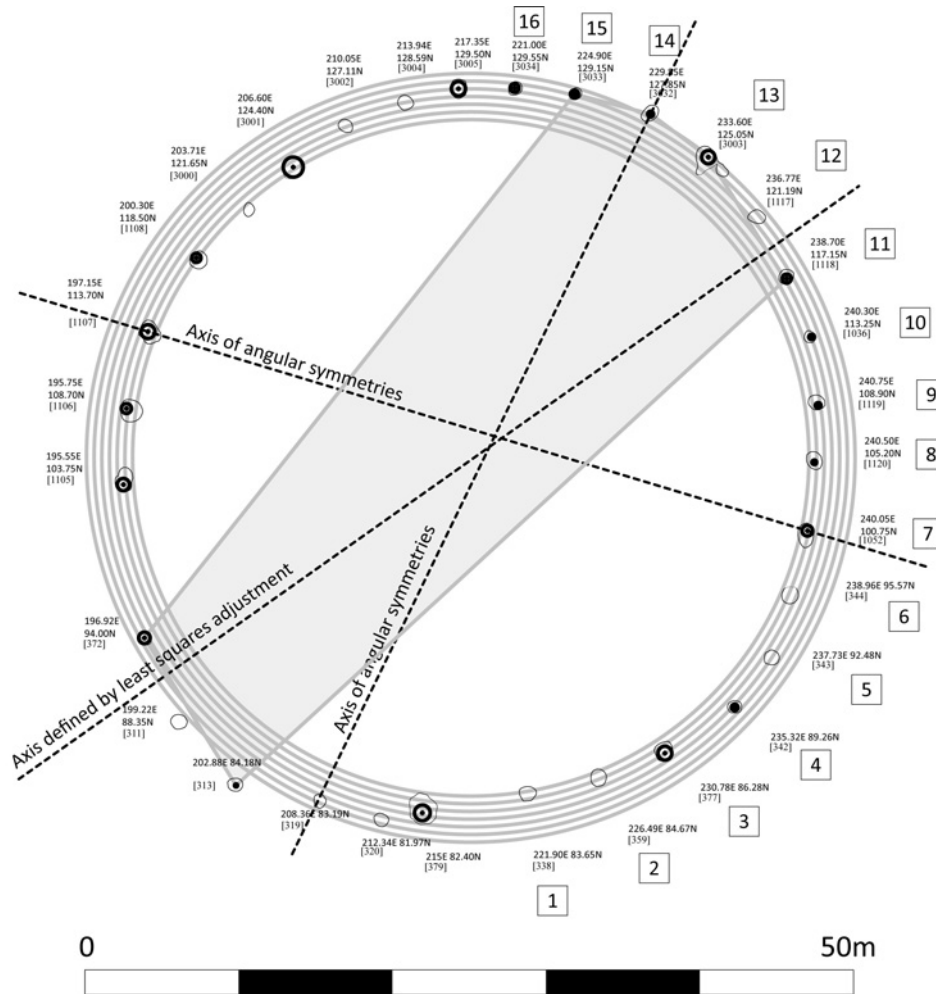


Fig. 24.
Optimum fit of a circle, with post-pipes

‘Feature 3’) which contained sherds of a similar pot, but no cremated remains, but might nevertheless have been a grave given its close proximity to Feature 2; this was also found in 1983 (*ibid.*, 33 and Cowie & Barlow 1987); and iii) sherds, probably from a single pot of the same basic tradition, discovered in 1997 in a spread of yellow-brown silt loam colluvium [104], underlying a grey-brown clayey loam [103], on the far western side of the terrace.

One of the scraps of cremated bone that had been found with the sherds of the urn in Feature 2 was radiocarbon dated in 2008, to 3040 ± 35 BP (SUERC-

16632, 1410–1210 cal BC). This date agrees with two that had been obtained in the 1980s from mixed-species charcoal samples (3000 ± 65 BP, GU-1976, 1410–1050 cal BC, alder and willow, and 2970 ± 55 BP, GU-1977, 1380–1020 cal BC, alder, hazel, and oak: Mercer & Rideout 1987, 38).

Whether the vessel that was found in 74 pieces in the colluvium (Fig. 17b) had also been used as a cinerary urn, or represents the domestic equivalent of the urn (ie, ‘Flat-rimmed ware’) is impossible to prove, but its similarity to the Bucket Urn – including the presence of a sub-rim perforation, 6 mm in diameter

(Fig. 17c) – suggests that it is likely to be roughly contemporary, and the presence of encrusted organic residues on some sherds suggests that it had seen use as a cooking pot at some point in its life. Most of the sherds are slightly abraded; some of the smaller ones heavily so. The wall thickness is *c.* 13 mm, and the fabric is hard, sandy clay with abundant angular rock fragments; it has a red/brown surface.

FEATURES OF INDETERMINATE DATE

Several pits, containing no artefactual or radiocarbon datable material, were excavated, as was a similarly uninformative V-shaped stretch of ditch [1283], 2.60 m long, 0.95 m wide, and up to 0.60 m deep. This was orientated approximately north–south and ran along the base of the break of slope on the western side of the main concentration of archaeological features (Fig. 3).

DISCUSSION

The various excavations have revealed a palimpsest of prehistoric activity on the Upper Largie terrace, ranging in date from the 5th to the late 2nd millennium BC, much of it funerary or otherwise monumental in nature. As such – if one sets aside the traces of Mesolithic activity – it offers an intriguing counterpart to the lower part of the Kilmartin Glen, with its rich array of Neolithic and Bronze Age sites that are mostly stone-built. As will be seen below, some of the discoveries are of international significance. This section will discuss the Upper Largie results in chronological order, encompassing the results of earlier excavations on the terrace, and will set the results in their broader context.

Mesolithic activity

Evidence for Mesolithic activity on the terrace is limited to the four truncated pits described above, of which one [3101] produced three samples of oak charcoal, dating to the 3rd quarter of the 5th millennium BC (GU-9374-76; Table 1). Given that no artefacts or structural remains were associated with these pits, little can be said about the nature of the activities, although the irregularity of Pit [3101], and the density of charcoal in its lower fill, suggests that it

may have been a fire pit of an overnight or temporary camp, perhaps relating to seasonal hunting in the forest. The location and south-facing aspect of the site suggests the deliberate selection of a sheltered spot for the camp. The similarity in form and proximity of Pit [3101] to Pits [3104/3100] and [3091] hints at their probable contemporaneity. Pit [3077] is also thought to belong to a pre-cursus phase of activity, but its fill contained no charcoal and it may not have shared the same function as those discussed above.

It was impossible to tell whether the dated oak charcoal had come from heartwood. However, even allowing for the possibility of the ‘old wood’ effect – and it is questionable whether a large ancient oak tree would have been felled to fuel a temporary camp fire – this represents by far the earliest human activity to be attested within the Kilmartin Glen. There may have been a Mesolithic presence at a small cave or rock shelter at Duntroon (RCAHMS 1988, 3; 1999, 4), but since the site has been destroyed and the finds lost, its dating must remain speculative. Mesolithic activity is well attested on the Argyll coast and the islands immediately to the west (eg, Jura), so there is no reason why further Mesolithic finds should not remain to be discovered in and around the Kilmartin Glen; indeed, one piece of struck flint of possible Mesolithic date was found within the last few years near Slockavullin (Sharon Webb, pers. comm.). A recent palaeoenvironmental review focusing on the Mòine Mhór predicted that such material is likely to be found above the 10 m OD contour, on ‘steep south-facing bluffs overlooking salmon rivers such as the River Add’ and ‘estuarine peninsulas and islands within the Crinan embayment’ (Housley *et al.* 2007, 358). The Mòine Mhór itself may well be covering some Mesolithic material.

Neolithic activity

The structural and artefactual evidence described above suggests that people were using the terrace at different times during the Neolithic period, although the question mark hanging over the dating of the ‘Avenue’ means that its inclusion as a Neolithic structure can only be provisional. Each structure will be discussed individually below.

Structurally, the Upper Largie cursus comprises a series of irregularly sized and irregularly spaced post-holes running in two, roughly parallel, lines and tapering slightly towards a gently squared-off

southern terminal (and, to judge from the 1988 aerial photograph, a more abruptly squared-off northern terminal); there is no evidence to suggest its construction in segments. The broadest and deepest post-holes occur at the southern terminal. Brophy has observed that some other cursus monuments in Scotland (eg, Douglasmuir and Castle Menzies) and England (eg, Stonehenge Greater and Rudston) have enlarged terminals and has suggested that this demonstrates the significance of the cursus terminal as a focal point (Brophy forthcoming). Oak charcoal was predominant in all 15 of the post-holes examined, and this indicates the deliberate burning of at least some of the posts *in situ* – a feature noted at other post-defined cursus monuments such as at Holm and Holywood, Dumfries & Galloway (Thomas 2007). Carbonisation would have halted at ground level or just below, due to a lack of oxygen. The underlying post stump would have decayed *in situ*, the core rotting first, creating cavities in the post-pipe into which fragments of charcoal from the charred post would have fallen (Barber 1997, 137; 1998). Taking into account the fact that some or most of the oak charcoal samples may well have come from ancient heartwood, the nine radiocarbon dates for burnt posts (Table 1) indicate that the cursus was constructed some time during the first half of the 4th millennium BC, perhaps most probably between c. 3800 and 3650 cal BC (Ashmore 2007a, 249). Whether a single phase, or multiple phases of construction and deliberate destruction had been involved cannot be determined with certainty from the dates alone. On the one hand, the absence of evidence for post-hole recuts tends to suggest a single phase of activity; on the other, the variability in post-hole diameter and the slightly ragged appearance of the alignments is reminiscent of the situation at Holywood North, where there had definitely been multiple episodes of construction and destruction (Thomas 2007, fig. 27.1). Whatever was the case, it may well be that the monument did not stand for a significant length of time before it was burnt down. The life expectancy of a timber post can be calculated at 15 years for every 50 mm of post diameter (Wainwright & Longworth 1971, 225). The post-pipes of the cursus measured 0.20–1.20 m in diameter and so the monument would probably not have lasted much more than 60 years, even if it had not been burnt down.

Several questions remain unresolved regarding the construction and use of the cursus. Might the presence

of smaller-diameter post-holes between larger ones relate to the cladding of the cursus with some kind of organic screen, which would not only have regularised the shape of the monument but would also have restricted access to the interior and dictated the movement of participants in associated ceremonies? The heavily truncated nature of the Upper Largie site makes it impossible to determine this, but if the larger posts had been linked by a screen, this would have helped a fire to spread. The near-absence of artefacts is characteristic of cursus monuments in general (although there are exceptions, as at Springfield in Essex: Buckley *et al.* 2001). The heavily-used flint scraper and flake found in Pit [303] may well relate to the construction of the cursus, rather than to its use.

The positioning of the cursus on a fluvio-glacial gravel terrace close to water is characteristic for this type of monument: cursūs occur preferentially, although not exclusively, upon flat river or fluvio-glacial gravel terraces and are more often than not aligned upon, or within sight or earshot of, rivers or tributaries (Brophy 1999, 128; 2000; Buckley *et al.* 2001; Gibson 1999. Note, however, that there may be a distributional bias since structures on fluvio-glacial terraces tend to show up clearly on aerial photographs). This association with water may be partly practical: floodplains or fluvio-glacial terraces are generally flat and therefore ideal locations for long, linear structures (Loveday 1985). The association is also thought by many to be embodied within social meanings and the significance ascribed to water: fertility, birth, death, liminality, linearity, and a social and spiritual boundary (Johnston 1999; Brophy 2000, 66).

The orientation of the Upper Largie cursus (which is slightly closer to north–south than that of the ‘Avenue’) is such that anyone walking down the outside of the monument may well have had extensive views down the Glen, and more restricted views up the narrowing Glen; for those inside the monument, the view down the Glen would have been obscured by the southern terminal (and by any screen that may have existed there). The site, and activities within it, would have been visible from above, from the hills framing the northern part of the Glen to the west (Coire Dhùnan) and east (Bàrr Mor). An archaeoastronomical survey of the cursus by Douglas Scott, undertaken partly during the 1995 excavations and partly on the basis of the aerial photographic evidence, has concluded that its southern, excavated

section could have been aligned to where the southern moon (with a declination of around $-29^{\circ}00'$) would have set near the top of Barnasload Hill during a major standstill – a phenomenon that occurs every 19 years. The unexcavated northern section, with its slightly different alignment, could have been aligned to where the moon would have set a day or so earlier.

Within the Kilmartin Glen, the Upper Largie cursus may represent the earliest evidence for Neolithic activity. It is likely to pre-date the construction of the Clyde chamber tomb at Nether Largie South, which, according to our current understanding of the chronology of Clyde tomb construction, is thought to have been erected during the second quarter of the 4th millennium (Sheridan 2007a, 456–7).

However, aerial photography and geophysical survey have revealed two other sites in the Glen that may turn out to be of Early Neolithic date. On the north terrace of the River Add, around 800 m east of Dunadd and at a commanding position at the southern entrance to the Glen (NR 8453 9338, NMRS NR89SW 53), cropmarks have revealed a north-west to south-east aligned pair of sub-parallel possible ditches, 1–2 m wide, 150 m long and 10–15 m apart, tapering towards a curved terminal at the south-east end and possibly open at the north-west end (Brophy, pers. comm. and information from Canmore, the on-line Scottish National Monuments Record database). This could be another cursus, although it is also described as a ‘long barrow’ in the Canmore entry and, according to Brophy (pers. comm.), looks more likely to have been a long barrow. The second site is a suspected avenue discovered by geophysical prospection at Ballymeanoch (Abernethy 1995). This manifested itself as a series of linear anomalies on the same alignment as a much later linear stone setting (see below); excavation of a 50 m by 1 m trench failed, however, to yield any additional information except in revealing a shallow ditch running north–south which may have held a palisade.

The presence of at least one cursus monument in the Kilmartin Glen represents a significant outlier to the overall distribution of cursūs in Scotland (Brophy 1999, fig. 11.1). Only one other is known from the west of Scotland, at Drybridge, Ayrshire (*ibid.*, 122). Otherwise, the 50 or so Scottish cursūs tend to be found in the south and east of the country, in lowland areas, with a marked concentration around Dumfries (although the known distribution is likely to have been biased by the fact that most reconnaissance

flights have taken place in lowland Scotland). Pit or post-defined cursūs are a Scottish phenomenon, with over half of the Scottish cursus monuments falling into this classification (see Brophy 1999 for summary); there is one possible English example at Bainton, Cambridgeshire. It is becoming increasingly clear that the earliest cursus monuments are to be found in Scotland, associated with the Carinated Bowl Neolithic, with the English and Welsh examples belonging somewhat later in the 4th millennium (Ashmore 2007b; Sheridan 2007a; Harding & Barclay 1999). Whether the apparent gap between the Kilmartin Glen example(s) and the rest of the Scottish cursūs is illusory or real may become clearer from future aerial survey and fieldwork. However, the Upper Largie cursus forms part of a set of evidence for early 4th millennium activity in this part of Scotland (reviewed in Sheridan 2007a) and it is known that the users of Carinated Bowl pottery – who may well have built the Upper Largie monument, despite the absence of pottery finds – established and maintained networks of contacts with each other over large distances, so the Upper Largie cursus should not be regarded as the work of an isolated community.

Much uncertainty surrounds the parallel pit alignment or ‘Avenue’. Unless a particularly informative pre-1993 aerial photograph emerges from the archive, its full extent will probably never be known, since its existence was not realised until the quarry had already destroyed part of it at the south-south-west end. Whether it had originally extended any further north-north-east, particularly along its shorter western alignment, is unclear. However, since analysis of the size and form of the surrounding features suggests that truncation was not as problematic here as elsewhere on the terrace it seems likely that the full extent of the original avenue at its north-north-east end was indeed identified during excavation. Similarly, there is confusion as to whether any of the pits had held posts: while its excavator claimed that no posts had existed (and the dominance of horizontal stratigraphy within the pits is indeed incompatible with the former presence of posts), nevertheless four of the 18 pits contained concentrations of stones that could have been packing for posts. The greatest uncertainty surrounds its dating which relies on a single fragment of oak charcoal from one pit. Given the quantities of oak charcoal available around the cursus, which has produced comparable dates, it is quite possible that this single fragment relates to cursus activity and not to the

construction of the 'Avenue'. The fact that the 'Avenue's' western alignment is close to, and at a similar orientation to, the eastern limb of the cursus (Fig. 2) cannot be taken to imply their chronological proximity.

The doubt surrounding the radiocarbon date for the 'Avenue' is heightened by the apparent spatial relationship to the Early Bronze Age timber circle. The western alignment stops just short of the circle, its northernmost pit [398] lying some 2.40 m from the nearest post-hole [338] on the circle. There is no evidence for the pits continuing beyond the timber circle or being truncated by it. Thus, the 'Avenue' appears to respect the position of the timber circle, seeming to abut it obliquely at a point at 90° to the circle's proposed main north-east-south-west axis (Figs 3 & 24). If this relationship is not coincidental, then this implies that the 'Avenue' could be of Early Bronze Age date.

Notwithstanding the uncertainty about its date, it seems likely that, like the cursus, the 'Avenue' had been designed to define a processional route, ordering movement in a particular direction, be it from the north-north-east towards the south-south-west and towards the edge of the terrace, looking down the Glen, or in the opposite direction, up the narrowing Glen. If the pit upcast had been used to create internal linear banks (as suggested by Halliday (1982) and Barber (1985) in discussing single pit alignments) then not only would the processional route be more clearly defined, but also the irregularity of the pit alignment would be masked. Scott's archaeoastronomical assessment of the orientation of the 'Avenue' (with its declination of -23°30') has concluded that if it had been aligned on a significant celestial phenomenon, the event will have been midwinter solstice sunset (declination of -23°27'), so the relevant procession would have headed south-south-west.

The closest parallel for this 'Avenue' – albeit one that is around half the width – is a pit-defined avenue at Holm, Dumfries & Galloway (Thomas 2007, 211–5). This features a c. 50 m long alignment of paired pits (of which some may have contained posts), spaced around 5–6 m apart. It is located close to a post-defined cursus (as is the case at Upper Largie), but clearly post-dates the cursus, as one of its pits cuts a filled-in cursus post-hole (*ibid.*, 210). Unfortunately, the dating of the Holm avenue is as insecure as that of the Upper Largie 'Avenue'; two samples of charcoal of short-lived species (hazel and heather) from the uppermost fill of one pit produced widely discrepant

dates of 3720±35 BP (SUERC-2119, 2210–2020 cal BC) and 2975±40 BP (SUERC-2123, 1380–1040 cal BC: Ashmore 2007b, 307–8).

Space does not permit a lengthy discussion of other potential *comparanda* and of the distinction between avenues and cursus monuments. Suffice it to note that the practice of constructing avenues (usually featuring posts) is attested from the Middle to Late Neolithic (ie, late 4th and early 3rd millennium BC), and stone avenues are known from the Late Neolithic and Early Bronze Age (as at Calanais, Isle of Lewis; Broomend of Crichtie, Aberdeenshire; and various sites in southern England, including Stonehenge: see Bradley 2006 for a recent review). The Middle and Late Neolithic timber avenues include those associated with large enclosures, as at Meldor Bridge, Scottish Borders (Speak & Burgess 1999), Forteviot and Leadketty, Perth & Kinross (Barclay 2001), and Dunragit, Dumfries & Galloway (Thomas 2004) and, outside Scotland, at Walton in Powys and Fordon Gaer in Montgomeryshire (Whittle 1997). They also include a recently excavated timber avenue found at Eweford, East Lothian (Lelong & MacGregor 2008): this is associated with Grooved Ware (like the Dunragit enclosure) and dates to c. 2600–2300 BC, or perhaps slightly earlier than that. None of these avenues provides as close a match for the Upper Largie monument as the Holm example. It may be that other close *comparanda* may emerge from an investigation of the many 'avenues' that have been noted in the Scottish cropmark record.

As indicated above, the evidence for other Neolithic activity is sparse, and the nature and significance of the activities represented unclear. There is insufficient evidence to prove a link between the putative structure represented by the cluster of post-holes on the western side of the terrace (features [202], [204], [206], and [212]) and the cursus, despite the presence of flint artefacts made from the same kind of flint.

The probable cooking pit of Late Neolithic date, Pit [106], dates to a period when, further down in Kilmartin Glen, the Temple Wood North timber circle (and also its stone replacements: Scott 1989) is likely to have been constructed. The presence, in Pit [004], of two fine, possibly Late Neolithic scrapers made from flint that had probably been imported from Yorkshire provides an important reminder of the external links of the inhabitants of the Glen. Further evidence for these links is provided by the two finds of Arran pitchstone from Upper Largie (one of which is

from the Bronze Age timber circle). Mid Argyll lies within an area of fairly abundant finds of pitchstone artefacts (Ballin 2008a; 2008b; 2009).

Copper Age activity

Despite the absence of human remains, a strong argument can be made for Pit [053], with its surrounding ring ditch [137], its set of three Beakers, and its flint artefacts, having been a grave for an unburnt body. The body had probably been placed in the pit, along with the grave goods, in a wooden chamber of some kind. This constitutes the earliest evidence for funerary activity on the terrace, although earlier funerary activity elsewhere in the Glen is represented by the aforementioned Neolithic chamber tomb at Nether Largie South.

While no precursor for either the form of the Beaker grave, or for the Beakers found within it, can be found in Late Neolithic Scotland (or indeed in the whole of Britain and Ireland), one can draw close parallels – both structural and artefactual – between this grave and Beaker graves in the Netherlands (as discussed and illustrated by Lanting & van der Waals 1976, eg, Anlo, fig. 33). Some of these Dutch graves contained wooden chambers or plank-built cists, and the former presence of such a structure at Upper Largie – covered with a small cairn of stones that tumbled into the grave when the chamber collapsed – would account for the observed stratigraphy of feature [053] and for the condition of the pots. The presence of a ring ditch surrounding a grave is known from numerous Dutch Beaker graves, both flat and under barrows (*ibid.*, 42); and several graves also have evidence for the former presence of a ring of posts within the ring ditch (*ibid.*, figs 30, 32, 33, 37). It has been suggested that the latter served to screen the grave prior to the erection of a mound (Drenth & Lohof 2005, 443). While interments within wooden chambers, in flat graves or under barrows, are a common feature of Beaker funerary practice in some other parts of Europe (principally central Europe: Heyd 2007; Turek 2004), the particular form of the grave as seen at Upper Largie – together with the kinds of Beaker present therein – finds its closest parallels in the Netherlands. Therefore, the possibility that we are dealing here with Dutch immigrants demands to be taken seriously (even if the absence of human remains, through their total dissolution, prevents this from being tested isotopically). The only obvious difference

between the Upper Largie grave and its Dutch comparanda lies in the orientation of the grave pit: Dutch graves with comparable Beakers tend to be north-west to south-east (and, less commonly, east-west) rather than north-east to south-west as seen at Upper Largie. Variability in the positioning of the grave goods within the Dutch graves does not permit us to hypothesise the likely disposition of the corpse at Upper Largie, or indeed its age and sex (although, as noted above, the presence of the flint fabricator/strike-a-light and knife suggests that it had probably been male: Drenth & Lohof 2005, 443). All that can be said is that the grave was large enough to accommodate the flexed body of an adult.

As previously indicated, all three Upper Largie Beakers are of international style, with two Epi-Maritime vessels (Pot 1 and the cord-zoned Maritime (CZM) Pot 2) and one All-Over-Cord decorated (AOC) vessel (Pot 3). These are, according to the latest typochronology of British Beakers, the earliest kinds of Beaker to be found in Britain (Needham 2005; *cf.* Sheridan 2007b for details of dated Scottish Beakers). This is confirmed by the radiocarbon dates from Pit [053], the ring ditch fill [138], and a post within the ring ditch [134], which indicate a probable date in the 25th or 24th century cal BC (ie, the Copper Age) (Table 1). Indeed, this dating of the Upper Largie assemblage is an important vindication for the oft-cited suggestion that CZM Beakers in particular – which are very rare in Britain – are early, not only here but also in the Netherlands and France (Needham 2005; Salanova 2000). Numerous Continental parallels exist for the individual vessels, and Epi-Maritime Bell Beakers can be found alongside AOC Beakers across a broad swathe of north-west Europe from north-west Germany to northern France (Needham 2005, fig. 3; see Salanova 2000 for French examples); but, once again, the area providing the closest comparisons for the Upper Largie assemblage as a whole, and for its individual pots, is the Netherlands. (Pot 2, for example, finds close parallels at Grossenbornholt and Fochtelo, and Pot 3 is paralleled at Hoenderlo: Lanting & van der Waals 1976, figs 21, 23, 24).

The Continental links of the pottery are not simply in their shape and decoration. The skill and technical competence of the potters in making such thin-walled, fine-textured pots, and in controlling their firing so as to achieve specific surface colouring is comparable to that attested among the Continental *comparanda* for

these pots, and also in the other earliest Beakers in Britain. This, and the method and style of manufacture, sets these Beakers apart from British pre-Beaker potting traditions. Among the novel features are the use of grog as a filler and the practice of scraping the surface. (The scarcity of the grog in the Upper Largie pots encourages one to question whether its inclusion was for reasons other than practicality: perhaps the 'recycled' pot had a symbolic significance.) Beaker manufacturing techniques have been discussed by van der Leeuw in 1976 (for the Dutch material); by Salanova (2000, for French Beakers), and by Hammersmith (2005, for Scottish early Beakers). The fact that the Upper Largie Beakers seem to have been made locally – a characteristic noted in various parts of Europe (Vander Linden 2007) – suggests that it was the potting tradition, and not the pots, that was moving around Europe. Indeed, the Upper Largie potter may well have been an immigrant, like the putative inhabitant of the grave.

The Upper Largie grave is therefore of international significance, not only as one of the earliest Beaker graves in Britain, but also as a rare example of a probable immigrant's grave. Within the Kilmartin Glen, its choice of location on the Upper Largie terrace, close to the ancient cursus (whose remains may still have been visible), made a statement about the importance of the individual interred there – and this importance is underlined by the subsequent deliberate positioning of the grave containing the footed Food Vessel, immediately next to this grave. There may well have been other similarly early Beaker graves (or other activity) in the Glen: a fragmentary Maritime Beaker with cockle-shell impressions in herringbone zones is known from the Poltalloch estate (Clarke 1970, fig. 80; RCAHMS 1988, 20, fig. C; *cf.* a similar Beaker from Glenluce: *ibid.*, fig. 79), and fragments of an AOC Beaker were found at 'Largie' (*ibid.*, 529).

Within Scotland, the Upper Largie grave finds parallels among a small number of other early Beaker graves, most of them suspected to be the graves of immigrants. The best-known example is from Newmill, Perth & Kinross, where a Dutch-style, herringbone-decorated All-Over-Ornamented Beaker was found in a Dutch-style grave pit (which had probably held a wooden chamber), encircled by a ring ditch (Watkins & Shepherd 1980). The flint knife found in this grave is comparable to the one found at Upper Largie. Other Scottish examples – including one

with three pots from Biggar Common, South Lanarkshire – are discussed by Sheridan (2007b; 2008) and Suddaby and Sheridan (2006). These graves have been found as pits, often in sandy or gravelly locations, and most are orientated east–west. In most of these cases, strong links with the Netherlands can be postulated. These graves have counterparts in southern England – most famously, in the case of the 'Amesbury Archer' in Wiltshire; there, however, the individual seems to have come from central Europe (Fitzpatrick 2002; *cf.* Needham 2005; 2007 on the likely origins of Britain's earliest Beaker users).

The discovery of the remains of dairy fat, probably milk, in Pot 3 is an important addition to the growing body of evidence for absorbed lipids in British pottery of the Copper and Early Bronze Age, as currently being researched by Lucija Šoberl. It raises the question of whether the milk had been used to seal the pot immediately after firing, or whether the pot had been deposited in the grave with an offering of milk (or milk-based liquid) for the deceased's journey into the Afterlife. Research is underway to address this question.

Early Bronze Age activities

The use of the terrace as a place of burial continued into the late 3rd and early 2nd millennium BC (and indeed later), but there is also evidence from the early to mid-2nd millennium for the renewed construction of ceremonial monuments; this will be discussed below. A variety of Early Bronze Age funerary practices is represented, from (presumed) inhumation within a timber 'cist' (in the case of Pit [132], with the footed Food Vessel), to inhumation within a stone cist, either unaccompanied by pottery (as in the case of Mercer and Rideout's 'cist 1'), or accompanied by a Beaker (as in Cist 3) or Food Vessel (Cist 1). The practice of cremation is attested on the terrace from as early as 2140–1920 cal BC (SUERC-16633) in Mercer and Rideout's 'cist 3', and so was clearly being undertaken as a contemporary, alternative rite to inhumation. The grave containing the probable Collared Urn (Mercer and Rideout's 'feature 1', dated to 1940–1750 cal BC, SUERC-16631) reflects a broader shift towards the predominant use of the cremation rite from around the turn of the 2nd millennium (Sheridan 2007c). Although no Bayesian modelling of the dates from the Early Bronze Age graves has been attempted, it seems clear that Beaker

pottery continued to be used after Food Vessels started to be used in the Glen during the 22nd century cal BC. The variation in the quality of manufacture and decoration noted between the rather crude Food Vessel from Cist 1 and the finely-made Food Vessel from Pit [132] is echoed in the contrast between the Beaker from Cist 3 and the very fine Beakers from the earlier, Copper Age grave. Similar variability has been noted elsewhere and may reflect differences between fine pots, made by specialist potters, probably for special individuals, and less fine pots, made by non-specialist potters, for 'ordinary' members of the community.

The apparently scattered distribution of the Early Bronze Age funerary monuments, and the large blank area on the terrace caused by unmonitored quarrying, make it hard to discern whether we are dealing with a single, extensive flat (ie, unrounded) cemetery, or with two or more such cemeteries on the terrace – one at the northern end of the investigated area, the other at the southern end. What is clear, however, is that the Early Bronze Age funerary activity on the terrace is echoed elsewhere in Kilmartin Glen, where numerous graves have been found, in various kinds of setting and displaying various amounts of conspicuous consumption in their construction and furnishing (see RCAHMS 1999 and below for details). Early Bronze Age individuals were buried in cists in flat cemeteries; in cists under cairns; in cists under and in cemetery cairns; in a cist inside a Class 2 henge (at Ballymeanoch: *ibid.*, no. 22); as secondary interments within the Neolithic chamber tomb at Nether Largie South (*ibid.*, no. 19); and in cists around or inside the Temple Wood South stone circle – with the latter, central cist arguably associated with the remodelling of that monument (Scott 1989).

Among the definite and probable funerary structures on the terrace, Pit [132], with its unique footed Food Vessel, commands special attention since the pot neatly expresses two of the key external contacts of the people who lived and flourished in this area during the 22nd/21st centuries BC.

Although no human remains were found in Pit [132], its size and shape, together with the presence of a Food Vessel, strongly suggest that this had been a grave. The fact that the Food Vessel was found upright and virtually intact suggests that there had probably been a wooden chamber which protected the vessel, although it must be emphasised that there was no surviving evidence for such a structure. The pot,

which had been skilfully made, probably by a specialist potter, uniquely combines elements of Irish Bowl Food Vessels (namely the shape and the decorative technique and scheme: Brindley 2007) with the applied feet (or rather legs) that are typical of some Food Vessels found in Yorkshire (and are illustrated, for example, in Manby 1995). Incidentally, such footed Food Vessels are not to be confused with the earlier, Continental-style polypod Beaker bowls that are known from Ireland and southern England. (See Earwood 1992 on wooden polypod bowls, including a radiocarbon-dated example, from Ireland.) Although an absence of suitable charcoal prevented an absolute date being obtained for Pit [132], the recent publication of a detailed typochronology of Irish Early Bronze Age pottery by Anna Brindley (2007) allows us to argue for a likely date of 2160–2080 BC for this vessel (*cf.* Sheridan 2004a on the dating of Scottish Food Vessels). In Brindley's typology – and setting aside for a moment the feet, which are never found on Irish Food Vessels – it is a Stage 1 Bowl.

The close proximity of this presumed grave to the earlier, Dutch-style Beaker grave – it cuts the latter's ring ditch – is unlikely to have occurred by chance, and indeed the two structures are similarly orientated (Fig. 7). This positioning, and the inclusion of a prestigious pot redolent of distant contacts, suggests that here was buried a significant individual, whose grave deliberately referenced that of an illustrious immigrant ancestor or predecessor. The Food Vessel is no less significant than the Dutch-style Beakers in the adjacent grave, for it encapsulates the cosmopolitan nature of the Kilmartin Glen elite during the 22nd–21st centuries BC, an apparent 'golden age' in this part of Scotland (and indeed elsewhere in northern Britain). The wealth and power of this elite may well have been based on their monopoly of the flow of Irish copper to other parts of Scotland (especially north-east Scotland, at the other end of the Great Glen), and bolstered by their harnessing of the sacred authority of pre-existing monuments in the Glen. It was displayed through funerary practices: the linear cemetery of ostentatious cairns along the Kilmartin Glen (RCAHMS 1988; 1999; Butter 1999) was established during the last two centuries of the 3rd millennium, and this included a 'makeover' of the pre-existing Clyde cairn at Nether Largie South to convert the cairn into the round form of the other, newly-constructed cairns along the Glen bottom. As

indicated above, the stone circle at Temple Wood South (Scott 1989) is likely to have been remodelled at this point, and a cist with unusually large end slabs (possibly made using stones from the dismantled Temple Wood North stone circle) was erected in its centre. 'Elite' cists in the Glen include the over-sized examples under the cairns at Nether Largie Mid and North and Glebe Cairn, some of which used slabs made from cup-marked stretches of outcrop, with images of flat metal axeheads superimposed on them at Nether Largie North (RCAHMS 1999, 33). Elsewhere in the Glen, rebated cists demonstrate the considerable expenditure of effort in their creation; and the luting of many cists with clay shows a concern with water-proofing cists to protect their occupants. And at Ballymeanoch (*ibid.*, no. 22), it may be that the Class 2 henge that surrounds two cists was created around the turn of the 2nd millennium, to lend prominence to the individuals buried in the cists. A date around this time for the erection of some henges elsewhere in Scotland has been established through the radiocarbon dating of material sealed beneath the henge bank at North Mains, Perth & Kinross and at Broomend of Crichton, Aberdeenshire (Sheridan 2003b, 167; Sheridan & Bradley 2007; *cf.* another henge of probable Early Bronze Age date at Dyffryn Lane, Powys, Wales: Gibson this volume).

The grave goods found in some of these 'elite' cists include some very fine Irish-style Food Vessels (as illustrated in RCAHMS 1988, 22, A–G) which may well have been made by Irish specialist potters. Indeed, the idea for using Food Vessels rather than (or as well as) Beakers is likely to have been adopted as a result of the Irish metal-importing links. Other grave goods, from rich female graves, include jet spacer-plate necklaces imported from Whitby in Yorkshire (Sheridan & Davis 1995; 2002); at Melfort, a 'necklace' made from parts of several spacer plate necklaces was accompanied by a fine pair of bronze armlets (Clarke *et al.* 1985, figs 4.38, 5.48).

The Upper Largie Food Vessel and the grave in which it was found can therefore be understood against this background. The grave may have been of equivalent social status to the other elite graves described above by virtue of its privileged juxtaposition against the older, possibly ancestral Beaker grave. The unique design of the Food Vessel explicitly references two areas – Ireland and Yorkshire – with which the elite must have had especially important links. It is clear that the skilled potter who

made the pot was familiar with Food Vessels both in Ireland and in Yorkshire; a visit to Yorkshire, or good information from people familiar with Yorkshire footed Food Vessels, would have been necessary in order to accommodate this feature in the pot's design. Connections with north-east Scotland are also, indirectly, attested through the presence in the north east of a few distinctively Irish Food Vessels, as at Seafeld West on the outskirts of Inverness (Cressey & Sheridan 2003); the route between Ireland and north-east Scotland is likely to have been along the Great Glen and to have passed through Kilmartin.

The presence of pebbles inside the footed Food Vessel – if not due to accidental ingress of material, or to the deliberate infilling of the cist – may well have amuletic connotations; *comparanda*, including one from a cist in a Food Vessel cemetery at Leven, Fife, have been discussed in Sheridan 2004a.

Just as the Early Bronze Age graves demonstrated continuity with earlier funerary practice on the terrace, the construction of the pit and pit/post-ring complex, the timber circle, and the post row during the early to mid-2nd millennium – and also, perhaps, of the pit 'Avenue', as noted above – echoed the earlier use of the terrace for other ceremonial activities.

The pit and pit/post-ring complex, which is similar in plan to the Copper Age Beaker grave but larger in scale, is enigmatic since its function, and the origin and significance of the waterlogged timber in the pit's secondary recut are unclear. Some questions remain concerning its relationship with the other structures on the terrace.

The structure lies within, and touches, the circuit of the timber circle, and also seems to overlies the southern end of the Early Neolithic cursus (Fig. 22). Stratigraphically it clearly post-dates the latter: its main pit may have obliterated at least one of the cursus post-holes and cut into Pits [572] and [578]. However, its chronological relationship with the timber circle is harder to prove since there are no unambiguous stratigraphic clues and since the use of oak charcoal – possibly entailing an 'old wood' effect – to date features in both structures complicates matters. If, in the light of dendrochronological observations detailed above, the timber circle might not have been constructed until some time between c. 1600 BC and 1400 cal BC, then it seems likely that the pit and pit/post-ring structure pre-dated it, bearing in mind the dates of 3350±45 BP (GU-9362, 1740–1530 cal BC) and 3390±60 BP (GU-9363, 1880–1530 cal BC)

for waterlogged roundwood of oak and alder from the secondary recut of the main pit, and the earlier (but possibly old wood) dates from oak charcoal from the ring pits [326] and [329] (see above). The relationship of the structure to the large post-hole/pit [379], and the function of the latter, is uncertain: this feature has been assumed to be part of the timber circle, but it could equally have represented a southern outlier of the cursus, aligned on its large post-hole [572], or perhaps a marker post for the pit-ring, analogous perhaps to the arc of large post-holes to the south of the Beaker grave. (Indeed, it could have fulfilled both functions). As for the chronological relationship between the pit and pit/post-ring structure and the post row some distance to the north, *prima facie* it would appear that the waterlogged wood in the secondary recut of the main pit may be contemporary, but once more it may be necessary to consider a possible ‘old wood’ effect, with regard to the post row date.

As regards the function of the pit and pit/post-ring structure, there is no evidence relating to its initial use. The record is dominated by the deposit of waterlogged wood from the fill of the recut, representing a secondary use of the structure. This wood includes some chopped pieces showing cut-marks made by a metal-edged tool and some offcuts of oak, one of which had been charred. The range of species represented – alder, hazel, rowan, *Pomoideae* species, and oak roundwood – is in stark contrast to the oak that otherwise dominates the ecofactual record at Upper Largie. Quite what the activity was that had led to the deposition of lengths and offcuts of wood is unclear. The roundwood had not formed part of a fence, and the assemblage resembles the detritus that one might expect to find in the ditch of a settlement.

The ambiguity of the evidence from the pit and pit/post-ring complex has given rise to two distinctive interpretations, each championed by one or more of the principal authors. The first sees the pit as a deliberately created open pool, the watery repository for the ritual depositions so favoured throughout the Bronze Age (*cf.* Bradley 1990). The water in the pool probably derived from a floating water table trapped within the gravels, sands and silts of the terrace; such a water table was evident during excavation and it must have been that which ensured the survival of the waterlogged wooden posts found in some of the post-holes of the timber circle. As the peat formed *in situ*

the pit will have resembled a dark stagnant pool with some standing vegetation. Over time it would have become choked with decomposing vegetation and silt washing in from its edges; eventually, it appears that a decision was made to recut the central area. More peat accumulated in the central hollow and lengths of roundwood, some of it worked, were thrown in alongside offcuts of wood. It was not possible to determine whether peat accumulation had been continuous or whether there had been a hiatus between the upper and lower layers.

This ‘artificial pool for votive deposition’ hypothesis sees the structure as being analogous to the much larger (25 m diameter, as opposed to Upper Largie’s 6.80 m diameter), deeper and later (Late Bronze Age) artificial pond known as the King’s Stables in Tray Townland, Co. Armagh, Northern Ireland (Lynn 1979). Here, a variety of objects – and even human remains – were deliberately deposited in the pond from the surrounding bank. The absence of such deposits from the Upper Largie structure, if one does not count the waterlogged wood as constituting votive material, weakens this interpretation although, as Becker has noted with regard to Irish peat bog depositions (2008), it is not unknown for deposited material to be retrieved subsequently.

The second interpretation is that the pit and pit/post-ring complex may represent the remains of another burial feature, similar to the Copper Age Beaker grave (Sheridan 2008b, 249). The complex bears a striking similarity in plan to that of the Beaker grave, although, as noted above, there are significant differences in scale: the pit is 6.80 m in diameter, compared with 3.20 x 1.75 m for the Beaker grave, while the surrounding ring is *c.* 11 m in diameter, compared with 5.70–5.80 m for the ditch surrounding the grave. Furthermore, there are indications that at least part of the complex had been used for burial; one of the pits [321] of the pit-ring contained a horizontal slab at a depth of 0.15 m, and directly beneath this was a deposit of cremated bone which, according to the excavator, could originally have been held within an organic bag or pouch (Radley, pers. comm.). This pit is also in alignment with the Early Bronze Age Cists 1 and 2 to the south (see below).

The radiocarbon dates obtained from the secondary deposit of wood in the main pit, and from [326] and [329] in the pit/post-ring (notwithstanding the possibility of the latter having an ‘old wood’ effect), suggest that the pit and pit/post-ring complex

post-dates the Copper Age grave, possibly by several centuries. However, they might also be taken to indicate a continuity in the design of funerary monuments at a time when other grave styles (ie, cist graves, and pits containing cinerary urns) had begun to be used in the Glen.

The timber circle (whose design and possible significance is discussed at length in the Appendix) is of slightly elliptical shape, with its major axis aligned north-east to south-west (Fig. 24) – the same basic orientation as the Early Neolithic cursus, the avenue, several of the individual graves, and the Early Bronze Age central post alignment. It had been constructed – probably in a single episode – using massive oak posts, the waterlogged remains of which were found in three pits. This, and the absence of charcoal from most of the post-holes, suggests that the posts had been allowed to rot *in situ*. The presence of charcoal in three post-holes need not indicate that the posts here had been burnt down; surface charcoal could have percolated down through the rotting heartwood of the posts (Barber 1997, 137). The estimated duration of the monument, given the rot-rates of timber, is 30–50 years; the preservation through waterlogging of fragments of three posts is probably due to the existence of the same floating water table, sealed within the gravels, which preserved the organics in the central pit of the pit and pit/post-ring complex.

An attempt was made to extrapolate the original post height on the basis of surviving post-hole depth, using the method formulated by Mercer (1981) and followed by Gibson (1994), featuring a simple ratio of 1:3.5 for the depth of post-holes to post height. If one assumes a uniform degree of truncation and allows for a 10 cm depth of topsoil, then the estimated height of the posts above ground surface ranges between 0.87 m and 3.08 m (Figs 25 & 26). Although the variability does not reveal a deliberate grading of height towards a particular orientation, it does suggest that no attempt was made to achieve a level plane on which to erect horizontal lintels joining the posts (as has been postulated, for example, for the timber circle at Sarny-Bryn-Caled, Powys: *ibid*).

The four radiocarbon dates, obtained from waterlogged oak from three of the post-holes and from oak charcoal from post-hole [1120], suggest a likely date for construction that may lie between c. 1600 cal BC and 1400 cal BC – in other words, well over a millennium later than the similarly-shaped timber circle at Temple Wood North (Scott 1989). The

timber circles of Britain have been reviewed by Alex Gibson (1994; see also Sheridan 2004b regarding examples along the northern and western fringes of Scotland and of Ireland, and Millican 2007 for Scotland as a whole). While many date to the Late Neolithic and are associated with Grooved Ware (for instance at Machrie Moor: Sheridan 2004b), some date to the 2nd millennium. For example, a timber circle 12 m in diameter and composed of nine large, deep post-holes has recently been excavated at Kintore, Aberdeenshire; oak charcoal from two of the post-holes produced dates – albeit possibly from old wood – of 3555 ± 35 BP (SUERC-7098; 2020–1770 cal BC) and 3480 ± 35 BP (SUERC-7092: 1890–1690 cal BC: Heawood *et al.* forthcoming). Similarly, a small timber circle just outside the henge at Broomend of Crichtie, Aberdeenshire, has recently been radiocarbon dated (from beech charcoal at the bottom of a post-hole) to 3432 ± 30 BP (OxA-18252, 1880–1640 cal BC: R. Bradley, pers. comm. and in press). While the overall trend over time in Britain tends to be from early, large, and sometimes complex timber and stone circles to later, smaller circles (Gibson 1994, 201, 205–6) – perhaps indicating that the emphasis was shifting to smaller groups or even individuals (Barnatt 1989) – the Upper Largie circle bucks this trend. Perhaps, once more, this highlights the special nature of the communities who lived around the Glen. The slightly elliptical shape of the Upper Largie circle is echoed not just at Temple Wood North, but also among the stone ‘circles’ of the west of Scotland (Burl 2000, 195–6). As argued in the Appendix, it is a moot point whether the Upper Largie circle had a specific archaeoastronomical orientation. However, Scott has postulated that different axes of the circle could have been aligned on different celestial events; thus the major axis, Axis 14 (Fig. 24), would have been aligned on the midsummer sunrise.

The presence of a pitchstone blade core in post-hole [1120] is noteworthy as a further example of external contacts. Whether it was contemporary with the timber circle, or incorporated as residual material, is unclear. Similarly, it is uncertain whether the presence of quartz flakes and a quartz chunk in post-hole [3000] relates to ceremonies undertaken at the circle.

The slightly irregular line of five post-holes – or rather a line of four, with an off-set fifth – at the northern end of the quarry, between the arms of the Early Neolithic cursus, shares the same basic orientation as the other structures on the terrace,

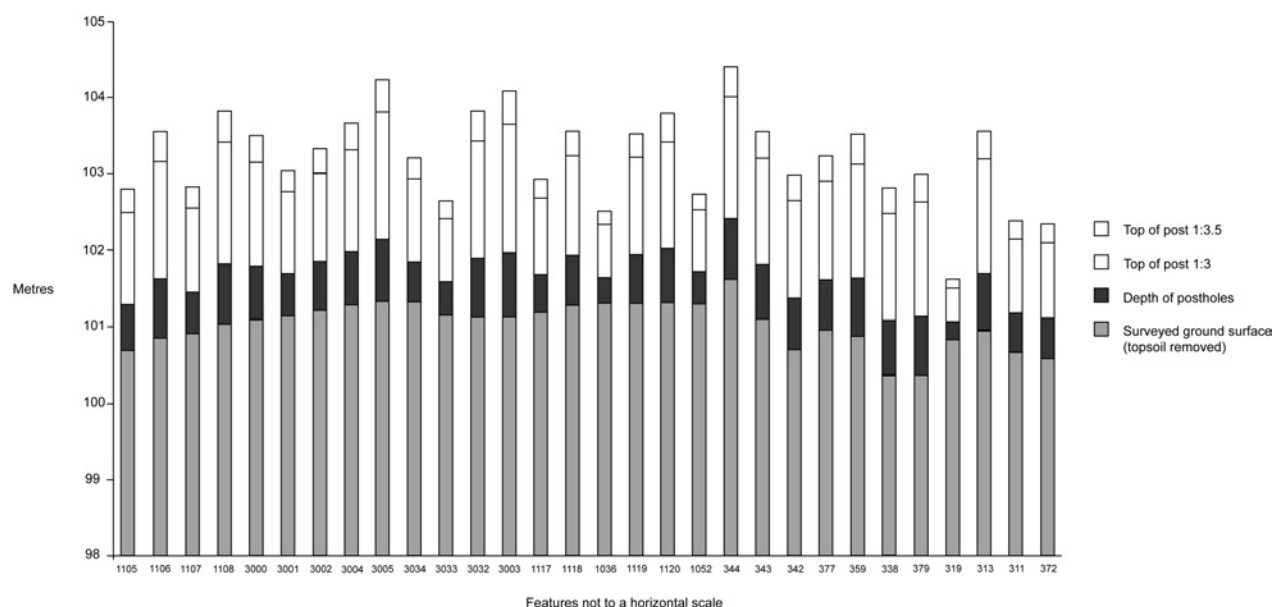


Fig. 25.
Graphic representation of calculated post heights in the timber circle

although it tends to lie closer to north–south than the others. As with the Early Neolithic cursus, it is not known whether this row extends beyond the northern edge of the quarry. The presence of abundant stones within the pits suggests that these had been packing stones for timber uprights, and the presence of a fragmentary, carbonised oak post in Post-hole [039] suggests that the posts may have been left *in situ*. Oak charcoal from this post-hole has produced a date of 3395 ± 35 BP (GU 15645, 1870–1560 cal BC) which, arguably, provides a *terminus post quem* for the erection of this row since the wood may have been old. Allowing for the uncertainties surrounding the use of oak for dating, it is at least possible that this activity was roughly contemporary with whatever led to the deposition of mixed-species wood, some worked, in the large pit [322], and possibly also with the construction of the timber circle.

The apparent alignment of these post-holes and possible contemporaneity with the timber circle, and the absence of other features in the immediate vicinity, suggests that they are more likely to be part of a monumental post alignment than of a fence or habitation structure. Elsewhere in the Kilmartin Glen, somewhat later alignments of stones exist (as at

Nether Largie and Ballymeanoch, the latter recently dated, through cremated bone in a stone-hole, to 2970 ± 40 BP (GrA-28613, 1370–1050 cal BC: Sheridan 2005, 183)). The Upper Largie post row differs in its orientation from the stone examples (see Ruggles 1999, 108–110 for a discussion).

Middle Bronze Age activity

The evidence for activity on the terrace that definitely or probably dates to the second half of the 2nd millennium BC, reviewed above, demonstrates that the terrace continued to be used for funerary activity during this period; whether the pot from the colluvium relates to funerary or domestic activity is unclear, although it seems to have been used for cooking at some point.

Elsewhere in the Kilmartin Glen, as we now know from recently-obtained radiocarbon dates, this period saw the construction of kerb cairn funerary monuments (including two inside the Temple Wood South stone circle, one of which had two phases of use) and also of at least one stone setting (a row at Ballymeanoch). Cremated bone from Temple Wood Burial D (Scott 1989, 88–90) – representing the



Fig. 26.
Reconstruction of the timber circle & the pit & pit/post-ring complex, viewed from the south

conversion of a pre-existing Early Bronze Age cist in the centre of the stone circle into a kerb cairn – has been dated to 3080 ± 30 BP (SUERC-17360, 1420–1270 cal BC: Sheridan 2008a), while cremated remains from the primary and secondary kerb cairn, Burial E (*ibid.*), has produced dates of 3065 ± 35 BP and 3100 ± 35 BP respectively (SUERC-17362, 17361; 1420–1220 and 1440–1270 cal BC). Further kerb cairns in Argyll & Bute, at Claggan (cairns 1 and 3) and Strontoiller, have also produced very similar radiocarbon dates from cremated bone: 3050 ± 35 BP, 2995 ± 35 BP and 2930 ± 35 BP (SUERC-16639–16641, 1410–1210 cal BC, 1380–1120 cal BC and 1260–1020 cal BC) respectively (*ibid.*). That kerb cairns are

contemporary with the construction of at least one stone row is indicated by the date of 2970 ± 40 BP (GrA-28613, 1370–1050 cal BC) obtained from cremated bone, found below the packing stones of a holed standing stone and close to a kerb cairn, at Ballymeanoch (Barber 1978; Sheridan 2005). Both the stone alignments and the kerb cairns, with their south-east facing ‘false portals’, display concern with astronomical orientation: Ruggles (1999) has argued persuasively that the stone rows were aligned on the moon at its southern major standstill position. These rows and other stone settings in the Glen feature the use of slabs cut from outcrops bearing ‘rock art’. This deliberate extraction and incorporation of a pre-

existing sacred monument echoes Early Bronze Age funerary practice and demonstrates the importance of ancestral sites to the Glen's users.

The contemporary presence of both kerb cairns and simple pit graves (ie, Mercer and Rideout's 'feature 2') in Kilmartin Glen demonstrates that during the Middle Bronze Age, just as during the Early Bronze Age, there was more than one way of dealing with the dead. Whether the differing forms of grave indicated status differences among the deceased is a moot point; but the placing of kerb cairns at significant locations, either inside a pre-existing sacred monument (at Temple Wood) or in the immediate vicinity of a stone row (as at Ballymeanoch) suggests that kerb cairn burial was indeed reserved for special individuals. By implication, the simpler Middle Bronze Age grave/s on the terrace may have been for less 'special' people.

SYNTHESIS AND CONCLUSIONS

The terrace has revealed abundant evidence for activities spanning over three millennia, and transforms our understanding of the use of the Kilmartin Glen as a whole. While uncertainties remain about the dating of some features at Upper Largie, such as the avenue, and while others – such as the ditch at the base of the break of slope on the western side of the timber circle (Fig. 3) – have provided no clues as to their date, nevertheless enough information has been obtained to produce the following overview of activities at Upper Largie from the late 5th to the late 2nd millennium BC.

Late Mesolithic (3rd quarter of the 5th millennium BC)

Temporary occupation, possibly in a clearing in a forest. Perhaps the people who camped here were on their way north-eastwards along the Glen towards the hinterland, where game was presumably plentiful, or southwards to exploit the marine resources of the west coast.

Neolithic (39th–25th centuries BC)

Early Neolithic use of the terrace for ceremonial purposes: construction of the post-defined cursus, probably between the 39th and 36th centuries cal BC.

Possible construction of the 'Avenue' (although this could equally have occurred in the Late Neolithic or Early Bronze Age). A Late Neolithic probable cooking pit [106], hints of a structure (attested by a cluster of post-holes), and stray finds of lithic artefacts that could be of Neolithic date, suggest other activities and indicate the external contacts of the terrace users, but do not provide unequivocal evidence that people were living (for any length of time, at least) on the terrace.

Elsewhere in the Kilmartin Glen: during the Early Neolithic, construction of a possible second cursus or (more likely) long barrow, and construction of the Clyde cairn as a collective funerary monument, probably during the 2nd quarter of the 4th millennium. At some point during the Neolithic (or perhaps the Early Bronze Age): construction of the putative avenue at Ballymeanoch. During the Late Neolithic: construction of the timber and stone circles at Temple Wood; development of 'rock art'.

Copper Age (25th–23rd centuries BC)

The Dutch-style Beaker grave hints strongly at the arrival of newcomers from the Netherlands in the Kilmartin Glen. Whether they had been drawn to this part of Scotland in a search for copper – there being sources of copper in the vicinity – is unclear. If the pit and pit/post-ring complex is to be interpreted as a grave (but see above) then it does suggest that a funerary practice established by the incomers, however sparse they may have been, continued over some centuries.

Early Bronze Age (c. 2200–c. 1500 BC)

Continuing use of the terrace for burial during a 'boom' time for the Glen in general, when ostentatious elite graves were built, pre-existing monuments (at Temple Wood and Nether Largie South cairn, and also outcrops and other stones with 'rock art') were reused and remodelled, and when the elite enjoyed extensive contacts with Ireland, north-east Scotland, and Yorkshire. Elite burial on the terrace took the form of a possible timber coffin grave, located immediately adjacent to the Dutch-style Beaker grave – perhaps the grave of an illustrious ancestor? – accompanied by a unique Food Vessel that encapsulates two of these key external contacts. The terrace was used as an extensive cemetery at this time, with cists containing either unaccompanied unburnt

or cremated remains, or unburnt bodies accompanied by a Beaker (in one case) and a Food Vessel (in another); the practice of burying cremated remains within a cist and an urn is also attested.

Renewed construction of ceremonial monuments: the timber circle and the post row (and possibly the 'Avenue').

Middle Bronze Age (15th–11th centuries cal bc)

Continuing use of the terrace for burial; unclear whether any 'domestic' activity as well. Elsewhere in the Glen: construction of kerb cairns (including those inside Temple Wood South stone circle), probably for members of the elite, and of stone rows and other settings with possible astronomical orientations. Redeployment of ancestral sacred sites (in the form of extracting stone from 'rock art' adorned outcrops for use as standing stones in settings).

Conclusions

The excavations at Upper Largie, and the strategic dating of other monuments in the Kilmartin Glen and elsewhere in Argyll & Bute (much of it funded by Historic Scotland and carried out as part of the National Museums' Scotland ongoing dating programme), have helped to transform our understanding of the nature and sequence of activities in the Glen. For the first time, evidence – albeit slight – for Mesolithic activity has been revealed; and an entire 'ritual landscape', contemporary with and complementing the ritual landscape which it overlooked lower down in the Glen, has been revealed.

However, much still remains to be investigated: relatively little is known about the evolution of the landscape, although a sizeable clearance of trees is implied in the layout and construction of the cursus, and it seems likely that the establishment of the Early Bronze Age linear cairn cemetery in the Glen bottom would have occurred in a largely tree-free area.

There can be no doubt that unmonitored quarrying between 1983 and 1993 has destroyed other material, although it must be admitted that the quarry development has led to the active investigation of much of this landscape. Future research might profitably be directed towards investigating the area immediately to the north of the quarry; locating likely locations for other Mesolithic activity in the Glen; and

investigating the putative Neolithic sites lower down in the Glen.

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APPENDIX 1: THE TIMBER CIRCLE AT UPPER LARGIE (John Barber)

A CIRCLE OR NOT A CIRCLE?

We begin the formal analysis of this post-hole setting by testing the simple hypothesis that it is a circle or, rather, it was intended to be a circle by its builders. It is assumed that if the builders' desire was to mark a circle by means of the posts once held in this setting, they would have wished to place the centre of each post on the outline of their chosen circle. This is an untestable assumption. They could have chosen to line the inner faces or the outer faces of the posts on the chosen circle outline. Of course, they may simply have placed the posts in a rough circle, perhaps using a central peg and a piece of cord to position each post.

Whatever their intentions and methods, our ability to recover the precise positions in which the posts were originally erected is compromised by the fact that we could not identify post-pipes for every post and indeed, some posts may be missing or have never existed. Surveyed positions known as 'post-hole centroids' were obtained for all post-holes and represent the best approximate position of the centre of the post originally occupying the post-hole. All of these ambiguities and approximations can result in error factors that are a function of change to the site since its construction and of our ability to retrieve the information that once existed on this site but may not reflect in any way on the abilities of the builders to position the posts as they would have wished. In general, we should be able to expect that errors accruing after the site's construction would be randomly distributed about the site.

If we accept that a circle was intended and we imagine it being struck by means of the central peg and length of cord already bruited, then we should expect each post-hole centroid to be equidistant from the original centre and that distance would be the radius of the intended circle (Fig. 24). Errors in layout, survival of the evidence and recovery of the evidence mean that even if a perfect circle had been intended we should expect some variation in the radii indicated and we should expect those errors to be normally distributed.

The mean of the coordinates of the post-hole centroids provides our best approximation to the original centre of the circle – assuming one was intended. The means of the X and Y ordinates of each post-hole centroid form our best approximation of the original centre. From this mean position, the distance to each centroid was calculated. This has a mean value of 23.34 ± 1.73 m. However, the recorded radii vary between 27.99 m and 20.73 m, a difference between longest and shortest radius of over 7 m. If we match pairs of post-holes across the circle and add the radii of each limb to form approximations to the intended diameter of the circle, we arrive at a mean diameter of 46.69 ± 1.92 m with a maximum diameter of 50.45 m and a minimum of 44.83 m.

The question prompted by the variance in the calculated diameters is whether these variances from the expected constant diameter of our postulated circle are significant or merely random errors. The values for the diameters suggest that these variations are not caused by random factors. Rather, there appears to be a cyclical error around the circuit of the circle because the axes along which they are measured rotate around the circle starting with post-hole centroid [338] (1) and ending at [3034] (15).

Assume accurate placement of posts

If the posts were placed on the line of the postulated circle, but not centred on it, the maximum diameter we should expect is the planned diameter of the circle, 'D', plus the diameter of the posts used, 'd_p'. This would arise when opposed posts were tangential to the postulated circle and outside of it. Similarly, the minimum diameter would be D minus d_p for the case in which the posts are again tangential but inside the circle of the postulated circle. Thus, the maximum variation would be twice the mean diameter of the posts. The observed post-pipes indicate that posts of the order of 650 mm were used on this site. Thus, the difference between the maximum and minimum diameters would have been 1.30 m if the builders were placing the posts within one post-diameter of the perimeter of a planned circle.

Assume random placement of posts

The cyclical pattern of diameter variation around the circle militates strongly against the assertion that they result from a random process. The diameter estimates are not normally distributed, as we might expect if their genesis had been a random process. Therefore an assumption that the builders placed the posts more or less randomly and roughly equidistant from some notional centre is not supported by the evidence.

Distortions due to topography

The topography of the site could contribute to the errors observed. Given that the slope measured on site amounted to not more than 2.5 m over its diameter, the maximum error caused by topography alone would have been of the order of 70 mm.

Errors caused by use of non-rigid measuring device

Elasticity in the measuring cord is sometimes adduced in explanation of variances observed in the field. In this instance the cordage used would need to extend by 12.5% under the average tension of one human pulling. This implies an improbable modulus of elasticity given the materials then available for cordage, eg hair ropes, braided leather cords, twisted grass or twisted fibre cords, etc.

Simple circle or more complex shape?

Thus far we have assumed that the builders of this site were trying to erect a simple circle of posts and we have considered that they might have been trying to do this quite accurately or, alternatively, perhaps only roughly setting out an imprecise circular shape. The significant variances in the recoverable diameters suggest that the builders may not have been trying to set out an accurate circle or that they may not have been capable of so doing. However, taken as a whole, the rather large variance in the observed diameters, their non-normal distribution and their cyclicity around the circuit of the circle suggest that something other than imprecision or the operations of purely random factors are at play here. This implies that the primary assumption, that a circle was the intended plan, may simply be false.

This conclusion is not capable of scientific test. We could of course attach statistical measures of the non-randomness of the data but these would be predicated on the initial assumptions and of little scientific value. The writer believes that it is a matter of faith, or of individual predisposition as to whether one accepts that this is a very strange circle but intended as a circle, or perhaps a more complex shape.

We have already demonstrated that the shape is not circular and have decided to reject the possibility that its gross departures from true circularity can be accounted for by poor or inadequate building technique. The following analysis is an attempt to explore the hypothesis that the builders of the post setting under consideration here intended to create a non-circular shape. The simplest deviation from a circular shape is an oval or elliptical shape, i.e. an 'elongated' circle.

METHOD

Examination of the plan suggests that there is a missing post hole between [1105] and [372]. Quarrying had removed the evidence in this area before AOC's excavations began there. We have substituted for a surveyed position, the means of the x and y values of the two bracketing post-holes. Otherwise the positions used in this analysis are those recorded in the field.

We have asserted that the post-hole positions define an oval or elliptical plan and we now speculate on whether the symmetry of the oval/elliptical shape was made manifest to the observer by physically emphasising the major axis in some way. This of course implies that the minor axis may also be demarcated because ovals/ellipses are symmetrical about both axes.

One obvious way to mark out the symmetry would be to dispose of the posts of the setting so that they were arranged

pairwise across the major axis. The posts in each pair would be equidistant from the axis and a line joining them would cross the axis at right-angles. It is possible that each pair of posts was the same height but this is untestable now.

POSSIBLE AXES

There are 32 post-hole positions, indicating 16 possible axes of symmetry. However, the symmetry could have been predicated upon an axis passing midway between adjacent posts and this would allow for an additional 32 positions and thus for an additional 16 possible axes. We can dismiss the axes that include one post-hole position and one midpoint position because these would all have one more post on one side of the axis than on the other. Thus, we have 32 possible axes of symmetry (Fig. 24). The number of axes tested has been restricted to the 16 axes terminating in a post-hole centroid at each end although we did include the midpoints between post-hole centroids in the calculations for each axis.

SYMMETRY TEST 1: MEASUREMENT OF THE ANGLES AT WHICH OPPOSED PAIRS CROSS THE SELECTED AXIS

For each axis, the post-hole centroids and the mid-points between them were taken pairwise and the angle between the line joining each pair and the line of the axis was measured. If the setting were perfectly symmetrical, this angle would always be 90°. An error factor was calculated by subtracting the measured angle (in degrees) from 90. A graph of the mean error per axis, compared with the range of the errors per axis is presented (Fig. 27).

Series 1 is the absolute range of the errors encountered in each of the axes (ie, maximum error minus the minimum error for that axis). Series 2 is the mean of all 32 errors for each axis. The axes are numbered 1–16 in the graph, 1 being [338/3005] and 2 being [359/3004], etc. If the shape were a perfectly symmetrical oval or ellipse, we should expect the distribution of errors to form a smooth sine wave, with the errors at or close to zero in two positions. These positions should prove to be at right angles to each other.

The results of this analysis deviate from a perfect error distribution, but not by very much. The results from the first six axes are rather worse than they might be if post-holes [319], [320], and [379] were more regularly disposed. These contribute to the very wide range of error values encountered at axes 4, 5, and 6 and reduce the value of the average as a diagnostic for these axes. Ironically, the net effect is to make the means of these axes rather closer to zero than they would otherwise be.

Nonetheless, two axes are distinguished with mean values close to zero; axis [1052/1107] and axis [3032/319]. These axes are not quite at right-angles to each other (they fall just under 9° short of a right-angle).

SYMMETRY TEST 2: THE DISTANCE OF EACH MEMBER OF EACH OPPOSED PAIR FROM THE SELECTED AXIS

We have suggested above that if the posts of the setting were symmetrically disposed about the selected axis, we would anticipate little or no difference between the distances from the axis to each members of every opposed pair. We have calculated for each axis, the differences between the distances of the opposed post-hole centroids from the axis. The difference between the distances as defined above is described as the 'error' for each opposed pair and again both post-hole centroids and the mid-points of the intervals between them have been used in the calculation. In Figure 27 we have illustrated the basic statistics of the average, standard deviation, maximum, and minimum values of the errors for each axis.

If the site was built to be symmetrical, then these values should approximate to zero for the selected axis. Minima are indicated in the interval between axes 14 and 15 and again at between axes 11 and 12. For the axes between 1 and say 8, the scale of the mismatch across the axis ranges, on average from 1 m to 4 m, with maximum errors of 8 m. The standard deviation, a measure of the dispersion of the data, in this instance reflects the variability in the calculated distances. The standard deviation reduces to minimum values between say axes 10 and 15, and is high elsewhere. Similarly, and reflecting the same trend, the range of the calculated values constricts to its minimal values in this area also.

Like the angular errors, above, the error distribution observed in the distance measurements is not random. It also displays a sine curve form which implies that there is an underlying pattern in the settings of the posts but one that is not recoverable with precision. We have noted, from the analyses of angular errors that an axis of symmetry is indicated in the region of axis 7, but the spread of distance errors gives no indication of any symmetry of distances about this axis. This is not a contra-indication. If the floor plan of the enclosed space were intended to be oval or elliptical, two axes of symmetry would necessarily exist and this is reflected in the angular analyses. However, the disposition of posts along the margin of the oval/ellipse could have been made symmetrical with either or both axes.

CONCLUSION

Firstly, we conclude that this is not a poorly constructed circle. The errors that would be required to arrive at the preserved remains from a starting point of a roughly constructed circle are simply not present. The observed errors are rather too large and too patterned in their disposition around its circuit. The site was intended to be an oval or elliptical setting, not a circular one.

Secondly, angular symmetry was identified along the 7th and 14th axes, which provides general support for the idea that the shape was oval or elliptical. Furthermore a distance symmetry test indicated again a patterning in the errors and that the best fit lay between axes 11 and 15, inclusive, with actual minima just beyond axis 11 and halfway between axes 14 and 15. This did not supply a single exclusive

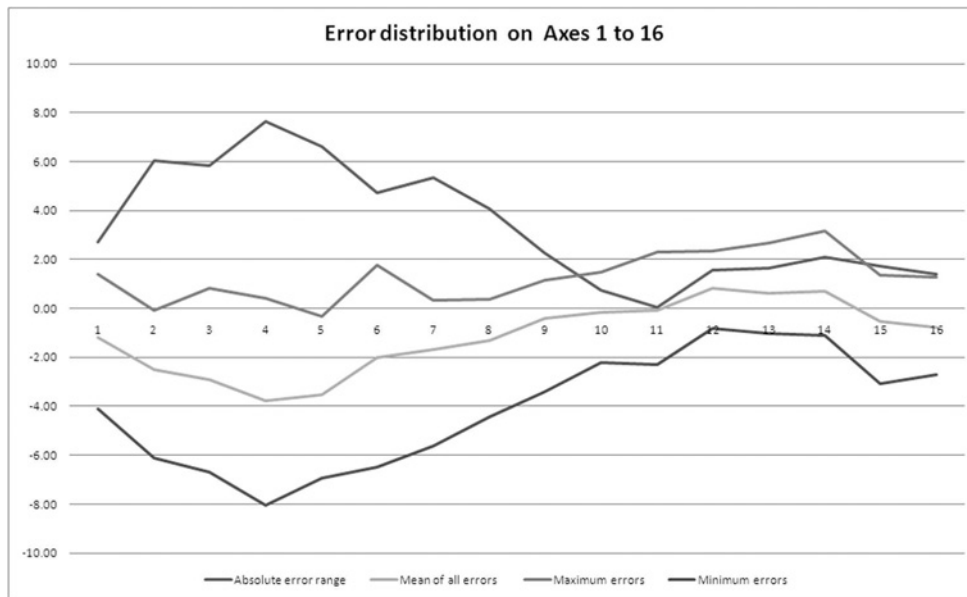


Fig. 27.

Mean error per axis for the timber circle post-holes, compared with the range of the errors per axis

answer but certainly, taken together it indicates a trend to symmetrical disposal around an axis in this area. We may say of axis 14 that at or near it we can identify an axis of symmetry for the plan-form of the enclosed area, with a second axis of symmetry almost, but not quite, orthogonal to it. We can also identify a symmetry in the dispositions of the posts about this axis.

However, statistical curve fitting places the optimum major axis of an ellipse through the mid-point between axes 14 and 13 and the numerical best fit for the distance errors lies between axes 14 and 15 (calculated in a previous draft of this paper). These uncertainties are all too characteristic of

archaeological data and the interlocking network of error factors introduced in the construction, post-depositional mechanisms of change and our recovery of the data prior to analysis.

Despite these uncertainties, the writer's conclusion is that this setting was intended to be oval/elliptical and not circular, that the major axis of this oval setting was disposed approximately along axis 14 or immediately adjacent to that axis, and that the symmetry in plan-form was echoed in the disposition of the positioning of the upright posts which were set up pairwise across the major axis, but which ignored the minor axis of the setting.